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ARCHIVES OF OPHTHALMOLOGY.

A CASE OF HYPOPITUITARISM, WITH HOMONYMOUS HEMIANOPSIA (SUPRASELLAR CYST?), COMPLETELY RELIEVED BY GLANDULAR TREATMENT.

BY DR. CHARLES A. ELSBERG AND DR. E. F. KRUG, NEW YORK CITY.

(With five illustrations in the text.)

IN spite of the advances that have been made in our knowledge of pituitary disease, the results of the surgical treatment must, in the main, be considered unsatisfactory. In experienced hands the danger of surgical interference is not very large, but in the majority of instances the operative procedures (sellar decompression, partial excision by the transfrontal route, etc.) are only palliative. Every case, therefore, in which marked hypophyseal symptoms are relieved by other than surgical treatment is worthy of special consideration. We believe that the following history has more than ordinary interest.

C. A., 23 years of age, was referred to one of us on June 13, 1914, by Dr. C. A. Whiting, on account of trouble with her vision. Her history was the following:

Menstruation began at 12 years of age and was regular until her sixteenth year, when it ceased. She was otherwise well until about three years ago, when her family noticed that she was not as bright as she had been, that she was often dull and drowsy and slept more than she had before. She often complained of a feeling of weakness. One year before, she had a mild attack of typhoid fever, and since that time had excessive thirst and polyuria. She had much

headache for three months and had become very irritable; she was very constipated. Several weeks before, she noticed that she could not see well.

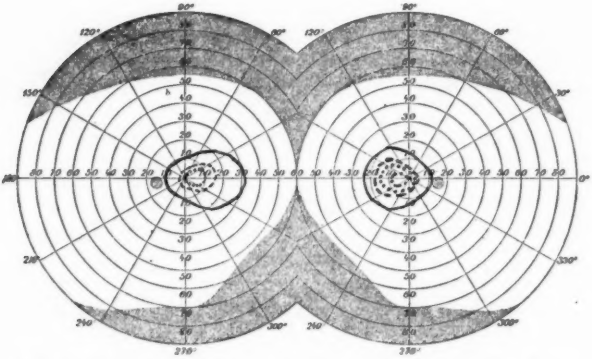


FIG. 1—Fields of C.A., June 13, 1914. There is a marked concentric contraction of the visual fields with tendency to temporal defects.

The patient is decidedly under-developed, and does not look her age. Although her complexion is pale, she appears well nourished. The breasts are prominent, but seem to contain little glandular tissue. The nipples are small without pigmentation. The pubic hair is scanty and there is no hair in either axilla. Examination of the lungs, heart, and abdomen is negative. Temperature 99.4° F.; pulse 100. Systolic blood pressure 90. Weight 110 pounds. Eye examination revealed the following:

Vision O. D. $\frac{20}{100}$, unimproved;
O. S. $\frac{20}{200}$, unimproved.

Pupils—sluggish, react to light and accommodation.

Fundus Examination: With the exception of slight narrowing of the arteries and slight pallor of the disks, there is nothing abnormal.

Visual Fields: Bitemporal hemianopsia, with decided contraction of the entire fields of vision (see Figure 1[1]).

The diagnosis of "probable hypophysis tumor" was made, and the patient was referred to Dr. Elsberg for surgical treatment. She was admitted into the Surgical Service of Mount Sinai Hospital on June 20, 1914.

In addition to the facts already mentioned, the examina-

[1] The perimetric fields were taken with 5*mm* test squares.

tion showed the following: The cranial nerves were normal. There was no anosmia. Power and sensation in the upper extremities was not disturbed. The reflexes were very weak but equal on the two sides. The abdominal reflexes were lively and equal.

The power of the lower limbs was good. The knee and ankle jerks were lively. There was a slight exhaustible ankle clonus.

The teeth were regular and the general shape of the face was normal. The urine was of low specific gravity (1002–1008), free from sugar, albumin, or other abnormal constituent. The X-ray examination failed to show any

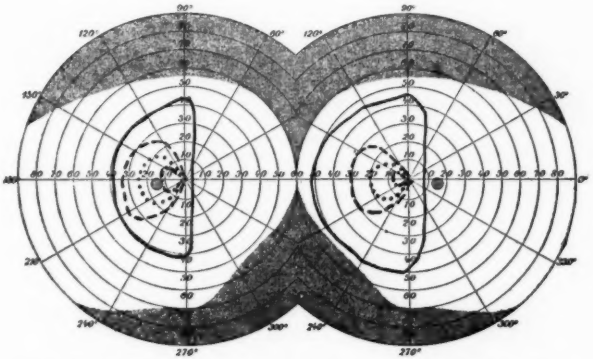


FIG. 2—July 25, 1914. The fields have changed since the last examination. There is now a right homonymous hemianopsia.

change in the sella turcica. As the patient refused to take lactose or glucose, the sugar tolerance could not be tested. Operative interference was not advised and the patient was transferred to the Neurological Service of Dr. B. Sachs. The examinations made in the hospital showed that the patient had slight pallor of the disks and complete temporal hemianopsia in the right and a beginning hemianopic defect for colors in the left eye. She was discharged from the hospital as a case of dyspituitarism, one week later.

Examination of the eyes by Dr. Krug, on July 25, 1914, revealed the following:

Vision O. D. $\frac{10}{200}$, unimproved;

O. S. $\frac{8}{200}$, unimproved.

Visual fields had changed to a right homonymous hemianopsia (see Figure 2).

From this time on the patient became steadily worse; she suffered more from headache and the periods of drowsiness were more prolonged. The fields of vision were taken at frequent intervals by Dr. Krug, and a constant diminution in vision was noted. She was given pituitary gland tablets (Armour), three grains three times a day for one month, without improvement. On account of the constant diminution in vision, she was readmitted to the Surgical Service of Mount Sinai Hospital, where a right subtemporal decompression was performed by Dr. Elsberg. At the operation, a moderate increase of intracranial pressure was noted. When she was discharged from the Hospital on September 27th,

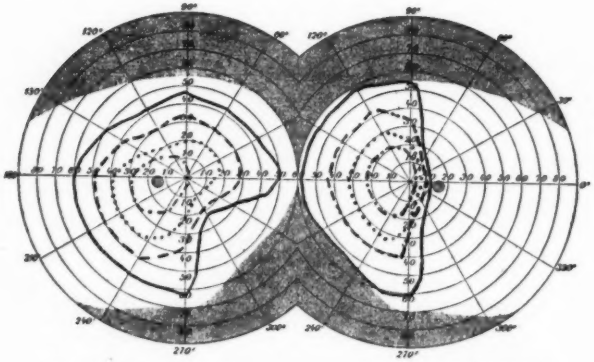


FIG. 3.—October 29, 1914. Six weeks after the subtemporal decompressive operation had been performed.

there was a marked improvement in the fields of vision, especially in that of the left eye. The examination of the eyes on October 29th is shown in Figure 3.

She was readmitted into the Surgical Service of Mount Sinai Hospital on November 12, 1914, in a deplorable condition (Figure 4). She was very pale and weak, her extremities were cold and cyanosed, she was unable to raise her head from the bed, and had frequent attacks of syncope. The blood pressure was so low that it could not be taken. She had almost continual headache and her sight was so poor that it could not be tested. The pupils were widely dilated and did not react to light. X-ray examination failed to show any enlargement of the sella turcica. The urine was of low specific gravity and showed no abnormality. Her pulse was imperceptible at times. There was slight bulging over the area of the subtemporal decom-

pression. Treatment with pituitary extract was then begun and the patient was daily given one cubic centimeter of pituitrin hypodermatically.

Two days after the treatment was begun, the improvement was striking. The patient looked and felt stronger, her extremities were warm and all evidence of cyanosis had disappeared; the pulse was easily palpable. Systolic blood pressure was 75, diastolic 55.

One week after the injections of pituitrin were begun, the patient was out of bed; she had lost much of the pallor; her general strength was much improved. There was no change in the visual fields when she left the hospital on December 1st.

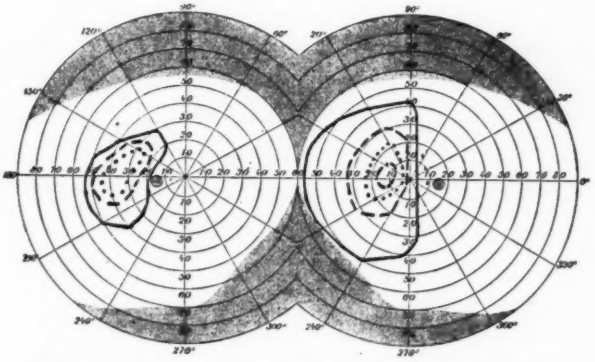


FIG. 4.—November 2, 1914. Before pituitrin treatment was begun. The visual fields, especially that of the left eye, are much smaller. Green was not seen on left side.

For the next two months, the patient returned to the hospital once a week for a pituitrin injection. It was soon noted that visual acuity was better, and that the fields of vision had enlarged. In the middle of January (eight weeks after the beginning of the pituitrin treatment) she had gained considerable flesh and strength; her color had become pink; her pulse was strong; she felt subjectively well, was bright, and free from headache. Her eyesight was very much improved, and the fields of vision were much enlarged.

March 1, 1915: Weight 125 pounds. Feels perfectly well and looks the picture of health. Has received pituitrin injections once a month for the past two months. Pituitrin treatment discontinued.

March 8, 1915: Examination by Dr. Krug:

Vision: O. D. $\frac{20}{30}$, Jaeger 1
O. S. $\frac{20}{40}$, Jaeger 3.
Visual fields (see Figure 5).
Slight pallor of optic disks.

October 15, 1915: Has gained forty pounds in weight and looks the picture of health. Has been menstruating regularly for three months. Vision excellent. Urine normal.

January 25, 1917: Patient feels well and her one complaint is that she has occasional nose-bleeds.

Vision: O. D. $\frac{15}{20}$ with cylinder # ½ ax. 90.
O. S. $\frac{15}{20}$ with cylinder # ½ ax. 90.
Fundi: Decided pallor of optic disks; vessels normal.
Visual fields: No change.

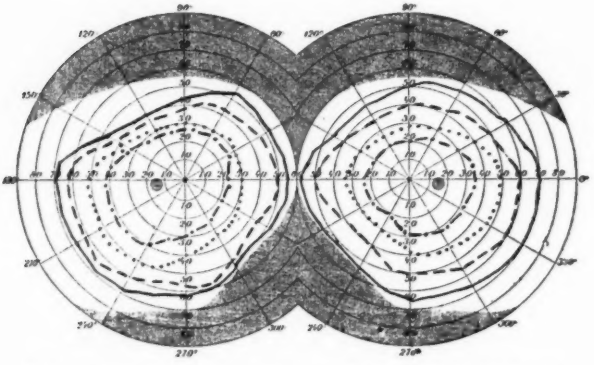


FIG. 5.—March 8, 1915. Four months of pituitrin treatment, showing the marked enlargements of both visual fields.

Remarks (Dr. E.): The above history would be one typical of pure glandular deficiency were it not for the fact that the eye-changes indicated a pressure on the chiasm or the left optic tract. The subtemporal decompression showed that there was some, if only slight, increase of intracranial pressure. The improvement after the decompressive craniotomy was very temporary and symptoms due to secretory deficiency and to pressure on the visual pathway reappeared. As the X-ray showed a small sella turcica and normal clinoid processes, we concluded that we had to deal with a condition of dyspituitarism with glandular deficiency and cyst formation. The rapid improvement after pituitrin treatment and the complete relief

not only of the cachexia hypophyseopriva but also of the hemianopsia after the injections of the glandular extract were very striking. We believe that in some disordered states of the pituitary body, in which there are both interference with secretory activity and cyst formation, glandular treatment may not only relieve the secretory deficiency but also may cause secondary cysts to be absorbed. One of us (Elsberg) has seen marked improvement in vision in another patient of this class, and a few similar cases have been reported in the literature of the subject. With the interrelation of the various ductless glands, polyglandular treatment may even be tried. Eason (*Proc. of Royal Soc. of Med.*, 1915, vol. viii., No. 3, Sect. on Ophthal., page 32) has described the case of a patient who was practically blind, who recovered normal vision and nearly a full field in one eye after thyroid feeding. The improvement had persisted for nine years; the patient had to take small doses of thyroid from time to time, otherwise vision would begin to fail and headaches return. Other cases of hypophyseal disease in which visual improvement followed treatment by pituitary or polyglandular extracts will surely be published from time to time.

Our own case is an evidence of the improvement that may occur, and has led one of us to suggest that in the field defects of hypophyseal origin, if associated with evidences of secretory deficiency, a thorough course of hypodermic treatment with glandular extracts should precede any operative interference.

SCLERAL TREPHINING IN DETACHMENT OF THE RETINA.[1]

By Dr. JOHN GREEN, Jr., St. Louis, Mo.

(With two illustrations in the text.)

THE treatment of detachment of the retina, whether medical or surgical, has always proved extremely unsatisfactory. There has seldom been a more striking example of unanimity of medical opinion than the replies to a questionnaire of Vail (1913) relative to the curability (or incurability) of this disorder. With only an occasional dissenting voice nearly three hundred American ophthalmologists asserted in the strongest terms their belief in the entire inefficacy of any form of treament. This collective view tends to confirm convictions which most of us, I imagine, have long held, viz., that detachment of the retina is, with rare exceptions, an incurable disease.

In this paper no attempt will be made to discuss the various theories of causation. I shall omit also a description of all of the medical and most of the surgical methods, which, from time to time, have been proposed for its relief. My purpose is to review the application of scleral trephining to detachment of the retina, and to comment on another operation, "pre-equatorial sclerectomy," which is, in effect, a modified scleral trephining.

It is not without interest, in this connection, that the operative method most in favor with American ophthalmologists (as determined by Vail's investigation) is simple puncture of the sclera, the knife penetrating to the subretinal space in

[1] Read before the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tenn., December 12, 1916.

order to afford an opening for the immediate egress of the subretinal fluid. After the knife is withdrawn the lips of the wound come into close contact, so that prompt agglutination soon puts an end to drainage.

The possibility of effecting a permanent channel, by means of a trephine opening in the sclera, for drainage of subretinal fluid into the subconjunctival space, seems to have occurred to a number of operators almost simultaneously.

Schreiber (1) appears to have been the first to propose this operation. After experimentation on rabbits he concluded that it was possible to establish a permanent passage for the flow of subretinal fluid into the subconjunctival space. He inserted a strong traction suture in the sclera at a point corresponding to the insertion of the inferior rectus. The globe was then rotated upwards and a triangular conjunctival flap was formed below the suture. The sclera was denuded either to the right or left of the inferior rectus and trephined, followed immediately by puncture of the choroid. A conjunctival stitch was then inserted to draw together the edges of the flap. Apparently without knowledge of Schreiber's work, Tiffany (2) on January 15, 1914, successfully performed scleral trephining in a patient with traumatic detachment. A small Elliot trephine was used to remove a scleral button over the center of the detachment. On removal of the button the protruding knuckle of choroid was clipped away, followed by escape of serous fluid and a little vitreous. Tiffany contended that the retina was forced into the opening of the choroid, "coming into contact with both choroid and sclera. At this point it forms firm and permanent adhesion."

W. R. Parker (3) reported a detachment of the retina occurring with neuroretinitis. For a year vision had been growing worse and was at the time of the operation $\frac{4}{60}$. Parker laid back a conjunctival flap, trephined the sclera, punctured the retina and choroid with a sharp knife, allowing serous and glairy fluid to escape. Eventual result: V = $\frac{6}{12}$; field partially restored.

In a subsequent communication Parker (4) recounted his experiences in fifteen operations on eleven patients, the first operation being performed May 19, 1913. A triangular flap of conjunctiva is made at a site corresponding as nearly as

possible to the lowest portion of the detached retina. Before releasing the flap from the grasp of the forceps, a suture is inserted, both for purposes of traction and eventually to replace the flap. A *2mm* trephine opening is made and after removal of the button, the choroid, or choroid and retina, is incised. The free escape of the subretinal fluid may be followed by a few drops of vitreous. After replacement of the flap, using supplementary sutures if necessary, the patient is returned to bed and kept recumbent for ten days. In summarizing results, Parker found that vision was improved in four, unimproved in five, and made worse in three cases. In eight the visual fields were improved, in three they were made worse. In three cases very good results were obtained. Parker states that his object "has been to secure an opening in the sclera and choroid which will allow free drainage of the subretinal fluid for a sufficient length of time to permit the retina to become reattached. If the secretory process is dormant and all the subretinal fluid evacuated at the time of the operation, reattachment may occur without œdema of the conjunctiva. But if the secretory process is active, or, if any amount of the subretinal fluid is left behind, a certain amount of reaction must necessarily follow or the retina will again be separated from the choroid and failure result. In each of the cases in which a good result was obtained, the operation was followed by a marked œdema which did not entirely disappear until the tenth day." Parker notes that the operation seems to be without danger to the integrity of the globe and that "the best results were obtained when escape of the subretinal fluid was followed by a discharge of a small amount of vitreous."

A modification of this method was proposed by Curtin (5) which he tried first on a patient with a spontaneous detachment of recent occurrence. After ten days of futile treatment (rest in bed, ½% atropin daily, pressure bandage, pilocarpin sweats), Curtin trephined the sclera but *without puncturing the choroid or retina.* The conjunctival flap was replaced with two sutures and the patient returned to bed and kept recumbent for ten days, the eyes being closed with a pressure bandage. At the end of this time the ophthalmoscope showed no evidence of reattachment. Twenty-five minims of fluid was then aspirated, by introducing the tip of a hypodermic syringe into

the subretinal space through the scleral opening. Immediately the retina was found reapplied and prompt recovery ensued, with final vision $\frac{20}{30}$. During convalescence the conjunctiva over the scleral opening was observed to be slightly chemotic, evidence of continuous drainage of the subretinal fluid into the subconjunctival space. At each dressing the conjunctiva over the opening was massaged to keep the opening patent and, as Curtin expresses it, "to facilitate the drainage between the subretinal and choroidal space and the subconjunctival tissues." Curtin claims the following advantages over simple trephining:

(1) Small amount of traumatism, the operation being done in two stages.

(2) No injury to the retina and no loss of vitreous.

(3) Absence of marked reaction.

(4) The possibility of the examination of the fundus during and immediately after operation.

(5) The possibility of repeated aspirations should the subretinal fluid reaccumulate.

In an elaborate paper in which various views of detachment of the retina are described and discussed, Thomson and Curtin (6) find that "the evidence on all sides . . . is in favor of some operative procedure which withdraws the subretinal and suprachoroidal fluid." Thomson, in a subsequent paper (7), sums up their views as follows: "The idea has been to get rid of the suprachoroidal fluid primarily, and secondarily to forcibly aspirate the subretinal fluid as completely as possible so as to allow the retina to reassume its normal position. The filtration through the trephine opening may then prevent more fluid from accumulating, and forcibly separating the retina from its position secondarily."

Three cases are reported in detail, of which two were successes. The operation was also done in ten other cases, all of which were old cases of detachment and were operated to determine whether the operation had any deleterious effect on the integrity of the eye.

Ohm (8), Brieder (9), and Lewis (10) report single successful results following simple trephining.

An operation similar in principle to trephining has been devised by Holth and called "pre-equatorial sclerectomy"

(11). It is thus described: A meridional incision is made in the sclera with a convex scalpel, or the point of a lance knife. Into this slit the blade of a Vacher punch is inserted and an opening of any desired size is made in the sclera. He reports good results in myopia and myopia with retinal detachment.

Schiotz (12) reports twenty-one cases of pre-equatorial sclerectomy in retinal detachment. The conjunctival flap is cut out and down. After incising the sclera meridionally a Holth trephine punch is used to excise the sclera down to the choroid (in some cases the choroid is also incised). His results were as follows: Five cases improved, nine cases continued as before operation, six cases made worse. The final result showed three cases improved, five in the condition they were before operation, eleven made worse.

Almost every year the literature contains reports of spontaneous recoveries from detachment of the retina. This fact should be borne in mind in crediting to any method of treatment a successful issue.

Case Reports:

Case No. 1.—Miss L. K., age 55, sewing-machine operator for a bag factory, consulted me June 28, 1916. Aside from moderate nearsightedness, which dated from early youth, she knows of no ocular disability. She wears R. and L. -5.5 sph. About May 15, 1916, she began to observe "spider-webs" before left eye. A week later the webs disappeared, but soon returned. R. -5.5 sph. V = $\frac{6}{6}$. L. -5.5 sph. V = hand motion at 60*cm*. Ophthalmoscopically, R.: a few dust-like opacities in the anterior part of the vitreous. Moderate conus, out. L.: extensive detachment of the retina, red reflex obtained only up and temporally. Field (taken with pocket flashlight) greatly contracted. The patient entered the hospital and was operated June 29, 1916. A conjunctival and tenonian flap was dissected up between the insertion of the inferior and internal rectus. On removal of the 2*mm* scleral button the choroid presented. A very delicate pair of straight forceps was passed, closed, into the subretinal space. On allowing the blades to separate, about 30 minims of yellowish fluid, slightly glairy, flowed out. The flap was replaced and sutured in position with two sutures. The patient was kept very quietly in bed, though no special effort was made to keep her in any one position. At the end of the first week she could count fingers at six feet. The end of the second week, however, witnessed a

return of the cobwebs and vision was no better than before operation. The patient declined to remain longer in the hospital and the result would have been classed as an unqualified failure, if the occurrence of a detachment in the other eye, July 20th, had not brought her again to observation. Opportunity was thus afforded to observe the first operated eye, the vision of which slightly improved, and on October 30th V = $\frac{1}{60}$. It was found also, that it was no longer necessary to employ a flashlight to outline the field, as the patient readily recognized the ordinary 10*mm* test object. Ophthalmoscopically, the vitreous was found filled with very numerous gray particles and the retina was still detached downward and outward.

CASE No. 2—Mrs. F. L., 60 years, consulted me April 15, 1916, complaining of failure of vision in the right eye beginning four months previously. A nearly central corneal scar prevented good vision in the left. Recently vision of the right had suddenly become worse, R. V. $\frac{6}{60}$. L. V. $\frac{1}{25}$. The right upper field was lost. The right vitreous was full of a fine network of opacities; there was a flat detachment of the retina in its lower part encroaching upon, but not including, the macula. Rest in bed for two weeks, with pressure bandage and potassium iodide internally proved an utter failure. On May 2d, the sclera was trephined between the insertions of the externus and inferior rectus, followed by the escape of a few drops of fluid. Following the Thomson–Curtin technic, the flap was replaced without perforating the choroid.

Two weeks later (the patient meanwhile having been kept in bed), vision had risen (with + 1 sph. + .5 c x. 180) to $\frac{6}{20}$. and a little tongue of vision had projected itself into the upper blind field. At the second operation (May 17th) I was unable to locate the trephine opening through the thickened flap and hence was compelled to dissect up the conjunctiva. A small platinum hypodermic needle was introduced into the subretinal space, withdrawing ten or more drops of a slightly glairy fluid. The flap was replaced with three sutures and the patient returned to bed. Vision remained at $\frac{6}{20}$ for 2½ months with nearly complete restoration of field. Ophthalmoscope showed that the retina had reattached except at one small area below. The patient was allowed to return to her home in the country and returned September 23d with a secondary detachment and vision fallen again to $\frac{6}{60}$. There was a complete loss of the upper field.

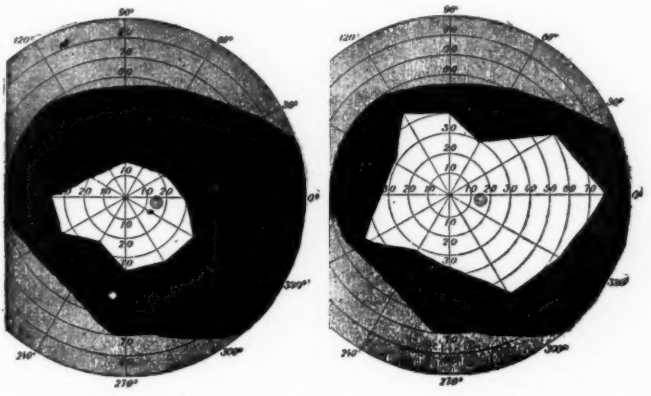
CASE No. 3—A. O., male, age 49, was first seen August

25, 1915. He stated that he had received a blow on the right eye five months before. R. V. $\frac{6}{10}$; L. V. $\frac{6}{6}$. Right eye showed a retinal detachment to the outer side and below. There were numerous fine floating opacities in the vitreous and some fixed thread-like bands extending transversely. Patient was treated with subconjunctival injections of sodium chloride 1% and cyanide of mercury 1:4000 without improvement. October 4, 1916, scleral trephining downward and outward with perforation of the choroid, which was followed by a gush of watery fluid. Healing was prompt and there was no undue reaction. During the course of the medical treatment vision had fallen to fingers at 1*m;* after the trephining it rose to $\frac{1}{10}$. There was no material change in the visual fields.

Case No. 4.—Occurred in the service of my colleague, Dr. Wm. F. Hardy. This patient, J. M., female, music teacher, age 67 years, came to the out-patient department of the Washington University Dispensary, September 12, 1916. She complained that for the past month objects seen with the right eye had seemed "green and feathery." Examination showed a detachment of the retina in the lower inner and outer quadrants. Transillumination was negative. Vision + 3 sph. $\frac{20}{70}$. Patient was admitted to the surgical ward, September 28th, and was operated by Dr. Hardy, October 3d. Following the removal of the trephine button delicate forceps were passed into the subretinal space, followed by escape of 30 minims of glairy fluid. Very slight reaction, and the patient left the hospital six days after operation. The last visual test was November 18th—right + 3.75 sph., V. $\frac{20}{30}$. No increase in the field. Ophthalmoscopically there is no change whatever in the position or extent of the detachment.

Case No. 5.—Concerned the right eye of Miss L. K., whose left eye forms the subject of my first case report. On July 20th, about ten days after leaving the hospital, following operation on the left eye, she suddenly went blind in the right. The next day she was led into the Clinic. The retina was very extensively detached, in fact it was impossible to outline the disk and no red reflex was obtainable. Vision = hand motion at 1*m*. In consultation with Dr. A. E. Ewing, it was determined to trephine. The operation was performed without incident, a 2*mm* trephine button being cut out between the insertions of the inferior and external rectus muscles. A fine pair of forceps was introduced, closed, into the subretinal space and the blades allowed to open slightly. There was an immediate gush of about

ten drops of a glairy fluid which looked like fluid vitreous. The conjunctival flap was replaced and the patient returned to bed where she remained quietly supine for two weeks. There was no improvement at the time she left the hospital. The folds of retina were still visible in all parts of the field. The patient was put on syrup of hydriodic acid and carefully watched. About September 15th there was a good red



CASE 5.—Field before operation. CASE 5.—Field after operation.

reflex from all but a small portion of the lower part of the fundus and vision had risen to $\frac{6}{60}$ with improvement in the field. Improvement continued and on December 8, 1916, Vision = $\frac{6}{10}$ with -5.5, and the field was nearly full, as shown by appended diagram. Ophthalmoscope showed a reattachment complete save for a small area in the lower part of the fundus.

SUMMARY

Cases 1 to 4 should be classified as failures—no permanent reposition of the retina and no material improvement in either vision or field.

Case 5 represents to date a success, but a success that at any time may be converted into a failure.

Cases 1 to 4 were all old detachments, associated with evidences of secondary inflammatory and degenerative changes.

Case 5 was operated on within three days of the occur-

rence of the detachment, the patient having been previously operated on for old detachment in the fellow eye (Case 1).

If we adopt an operation which withdraws the subretinal and suprachoroidal fluid and, as Thomson and Curtin have remarked, the evidence is all in favor of some such procedure, is it not more rational to operate as soon as possible after the occurrence of the detachment rather than to temporize with non-surgical methods, thus letting pass what may be the most favorable time for operation?

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AN UNUSUAL FORM OF SUPERFICIAL CORNEAL OPACITY, PROBABLY AN INSTANCE OF ATYPICAL EPITHELIAL DYSTROPHY.[1]

By Dr. WILLIAM CAMPBELL POSEY.

(With one illustration on Text-Plate I.)

DURING the summer of 1914, while on my holiday, I was consulted by Mrs. X., a vigorous young married woman with nothing suggestive of an etiological factor of her ocular complaint in her family or personal history, save a vague gouty tendency. The ocular affection for which my advice was sought consisted of a mild attack of conjunctivitis of both eyes which yielded readily to argyrol and appeared to be of the acute catarrhal type.

The patient passed from under my observation until February of the succeeding year, when she again consulted me, on account of what she supposed to be a recurrence of the same affection which had annoyed her during the summer. Examination showed a mild type of conjunctivitis limited to the left eye and in addition a small circular area of opacity in the cornea consisting of a faint stippling of the epithelium near the limbus, in the upper-outer quadrant. The right eye was unaffected and has remained so throughout. As there was an accompanying severe cold in the head, rhinological treatment was advised, salol administered internally, and argyrol, atropine, saline washes, and hot compresses prescribed locally. At the end of a week, the conjunctival congestion having entirely subsided, argyrol was stopped, but as the corneal haze appeared to be somewhat more pronounced, atropine was

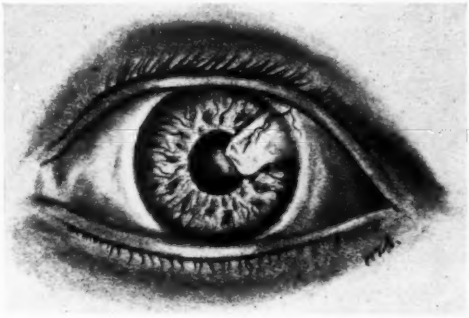
[1] Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, January 18, 1917.

continued, and massage of the eye with yellow oxide salve ordered twice daily. Vision with proper convex sphero-cylindrical lenses was normal. A week of the treatment just outlined appearing to exert no influence upon the corneal haze, which still, however, remained localized, the yellow oxide salve was discontinued and a one per cent. solution of holocaine substituted. Two weeks then elapsed before the patient again submitted herself for examination, when careful study of the corneal opacity with a loupe showed that the haze, which appeared to reside entirely in the epithelial and subepithelial tissues, was non-vascular, and was made up of a large number of small grayish punctiform spots. A zone of about *2mm* of clear corneal tissue intervened between the limbus and the affected area. There were but few subjective symptoms, the patient averring that the eye caused her but little annoyance, though at times there was the sensation of roughness or sand beneath the upper lid. Eversion of the upper lid, however, showed the conjunctiva to be normal.

Although a more rigid continuance of the treatment was insisted upon, this advice was not followed, and no opportunity was afforded of examining the eye until six months later, when a sharp recrudescence of the symptoms, which had never been entirely absent during the period mentioned, again brought Mrs. X. to my office.

Examination revealed the following. Eye slightly injected. In the upper-outer quadrant of the cornea there was a distinct opacity, somewhat glistening white in appearance and presenting some of the characteristics of an ordinary phlyctenular ulcer of a rocket type, inasmuch as a number of bundles of superficial vessels coursed to it from a slightly injected limbal base. The opacity, however, differed from the phlyctenular forms inasmuch as its surface was flat and rather plaque-like. Its advancing border was convex, that nearer the limbus concave, giving an arch-like appearance to the mass. Just in front of the advancing convex border there was a fine dust-like haze with a sharply limited convex border. This portion of the mass was slightly stained by fluorescin, and evidently represented its zone of progression, the denser whiter arched plaque the older portion. While the rest of the cornea appeared normally sensitive, there was pronounced anæsthesia of the

ILLUSTRATING DR. POSEY'S ARTICLE ON "AN UNUSUAL FORM OF SUPERFICIAL CORNEAL OPACITY, PROBABLY AN INSTANCE OF ATYPICAL EPITHELIAL DYSTROPHY."



upper-outer segment. The patient was again admonished as to the need for more constant and persistent treatment and an attempt was made to absorb the opacity or at least to stop its progress by massage with yellow oxide of mercury in increasing strength, and by dionin. After several weeks of conscientious persistence in treatment, the patient again permitted her social duties to interfere with the proper care of her eyes and she was not seen until another six months had elapsed. The opacity was now found to be broader, thicker, and more densely white. The advancing epithelial haze had also extended and had reached the pupillary border. Consultation was advised and Drs. de Schweinitz and Wilmer were both seen. Both these gentlemen concurred in the diagnosis already rendered, *i.e.*, an unusual form of corneal dystrophy, and a continuance of much the same treatment advised. Treatment was now more rigorously adhered to, with the result that during the past six months there has been a gradual decrease in the activity of the advancing zone of opacity, and a decided clearing of its base, synchronous with a disappearance of the superficial vascularity. Corrected vision is still normal, though the refraction has changed as follows. In March, 1915, manifest refraction in O. S. equalled + S. O. 25 D. ⊂ + C. O. 50 D. ax. 90°. When last seen, one week ago, + C. 1.62 D. ax. 60° was required for correction, showing the distortion of the cornea occasioned by the pathological process.

The explanation of this unusual form of corneal opacity appears to me to be as follows. Trophic change of the epithelium in the affected area, in consequence of the preceding conjunctival inflammation. Proliferation and change, doubtless of a hyaline nature, in the epithelium and sublying Bowman's membrane, giving rise to the older and denser arch-like form of opacity. At the last meeting of the American Ophthalmological Society, Dr. Bordley reported two very similar cases which followed trauma through the closed lids. Dr. de Schweinitz thought there might also be a traumatic agency in the case under discussion. Careful questioning, however, elicited that the patient's statements which had evoked this suspicion were misleading and that this factor could be eliminated. In several cases of a somewhat similar type studied by Dr. Wilmer a traumatic history was obtainable,

but in his letter to me he referred to the different appearance presented in Mrs. X.'s eye to that observed in classical cases of corneal dystrophy in elderly people, where, in the cases he had seen, marked anæsthesia was absent.

From the recent progress of the case, it would appear likely that the advance of the opacity will be stopped before the entire pupillary area of the cornea has been involved, and while it is unlikely that it will entirely disappear, it seems safe to assume that the continued use of absorbifacients will in time reduce the haze to bare perceptibility by the naked eye, and that the astigmatism occasioned by the corneal distortion will lessen.

GLAUCOMA SIMPLEX WITHOUT PERCEPTIBLE RISE IN TENSION.[1]

By Dr. HARRY S. GRADLE, Chicago.

UNDER this title, I wish to bring up for reconsideration a definite type of non-inflammatory glaucoma. Von Graefe recognized the disease, but did not class it as a glaucoma (*Amaurose mit Sehnerven Exkavation*), and it remained for Schmidt-Rimpler, some seven years later, to classify it as such. Owing to the difficulty in diagnosis and the rarity of the condition, reports of this type of glaucoma occur but seldom. I refer to the class of cases known as "Glaucoma Simplex without Perceptible Rise in Tension."

Sattler claimed that these cases invariably must at some time have an increased tension, and I am reopening this subject because I have seen recently a case of this character during one of the periods of increased tension. A single woman, 67 years old, was brought to me in consultation because of an increase in her myopia and a decrease in her vision. Four years previously, −0.50 sphere, combined with a weak cylinder, gave her R. $\frac{15}{30}$, L. $\frac{15}{20}$. The sphere has been increased on three different occasions until she now wears: R. −1.00 s. with cylinder and L. −1.50 s. with cylinder, giving her vision of $\frac{20}{50}$ and $\frac{20}{30}$. She has had some headaches. Several years ago, her left ethmoid was exenterated for a cerebral rhinorrhœa of several years' duration. This subsided after some months and has given her no trouble for over a year.

Externally both eyes were normal and the pupils reacted well. The right lens and vitreous were clear. The peripheral retina seemed normal, but the peripapillar retina was slightly

[1] Read before the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tenn., December 12, 1916.

hazy and fluffy, although no exudate could be seen. All of the vessels were slightly dilated but not tortuous. The disk edges were blurred in spots as though covered by an œdematous translucent retina. The disk was of a peculiar gray color with darker shadows near the periphery. There was positively no glaucomatous excavation. The left eye showed a very similar condition with the exception that the edges of the disk were clearer and the gray color of the disk more pronounced. There was no marked difference in the niveau of the disk and the surrounding retina in either eye.

The blind spots were enlarged very slightly, if at all, but not pathologically. No scotomata could be found. The fields were practically normal. The tension of the right eye was 30*mm* Hg. which was reduced by one minute of massage to 20*mm* Hg. The tension of the left eye was 24*mm* Hg.

Because of the increase in the myopia, the headaches, the inexplainable decrease in vision, and the ophthalmoscopic appearance of the disk, I concluded that this was one of those cases of "Glaucoma Simplex without Perceptible Rise in Tension." Moreover, the increased tension in the right eye, which yielded quickly to massage, confirmed this view, provided we accept the before-mentioned statement of Sattler. The mental disturbance occasioned by a long railroad voyage to the city and the uncertainty regarding her condition were probably the exciting factors of this passing rise of pressure which had never before been noted. Her oculist had tested her tension several times, although only with his fingers. Since her return home to a quiet life, the tension has not again been observed as high as thirty during a period of several weeks, with weekly tonometric readings.

This disease seems to be confined to individuals over sixty years of age and is always bilateral, although one eye is usually more involved than the other. A low degree of myopia, with or without astigmatism, is usually present, and it is the increase in this myopia that often brings the patient to the oculist. Occasional headaches are the rule, but they are not of the unrelievable type accompanying inflammatory glaucoma. Apparently, this symptom is the result of the infrequent and usually overlooked temporary rise in tension before alluded to. The reflex gastric irritation of the acute inflammatory glau-

coma is absent. Externally, the eyes appear normal. Until late in the disease, the pupils react freely and normally, although in the later stages the reaction to light becomes slower and eventually disappears; but the characteristic dilated pupil of the ordinary glaucoma is entirely lacking. Both macroscopically and microscopically the chamber angles are free from adhesions. The lens may show a few striated opacities but I consider them to be incidental, rather than the result of the disease. During the earlier stages, the optic-nerve heads show but few changes. When seen during a period of increased tension, a slight œdema of the retina, simulating a low-grade neuritis, may be observed. But while the tension remains within the so-called normal limits, the only ophthalmoscopic changes to be found consist in a gradually increasing area of pigment and choroidal atrophy surrounding the disk and a gradually increasing pallor of the disk. This peculiar color is not at all like that of either ascending or descending atrophy, but is ash-gray. Near the edges of the disk is a darker area as though a shadow were cast here. The floor of the disk is not markedly depressed nor is there any glaucomatous excavation. The vessels may be slightly dilated but show no marked changes. The peripheral retina is normal. If seen during a period of increased tension, there may be a fluffiness of the retina immediately around the disk, but this does not extend into the periphery and soon subsides.

As the disease progresses, the atrophy of the nerve head advances and the typical glaucomatous cupping makes its appearance. Now the tips of the lamina cribrosa begin to show and henceforth are constantly to be seen. The cupping is very uniform, in contradistinction to the other types of glaucoma where the cupping usually appears at one side of the disk and spreads around the periphery. Furthermore, the process is very slow in its development, requiring three years in one case that I observed. During this time, the vision gradually decreases, irrespective of the increase in the myopia and of the fairly well-preserved visual fields.

As these patients seldom are under constant observation, the curve of intraocular pressure has never been studied accurately. Practically all observers agree that the tension seldom exceeds the limits empirically called normal; *i.e.*, 24–26*mm* Hg. But

there is no doubt in my mind that at times there is an increase in the tension. This accounts for the irregular headaches. However, we do not see the marked increase in tension so characteristic of the other forms of glaucoma. The visual fields show but few changes. There may be some concentric narrowing, especially for colors; but the marked defects, both peripheral and pericentral (Bjerrum), are entirely lacking. This remains true, even in the later stages of the disease.

The prognosis must be considered fairly good, because the disease does not appear until late in life and then is very slow in its development. After a complete excavation of the nerve head has appeared, the progress seems to be even slower than during the earlier stages. As a rule, the patient succumbs to some intercurrent trouble before blindness intervenes.

A case well illustrating this was that of a 68-year-old man who consulted me in May, 1911. He complained of diminution of vision during the past year and "black cobwebs" before the right eye. A − 0.50 sphere combined with a weak cylinder gave him bilateral vision of 0.9. Externally both eyes were normal and the pupils reacted normally. The anterior chambers were of normal depth. A few faint lenticular opacities and one small vitreous floater in the right eye accounted for the "cobwebs." Under mydriasis, I found a myopic crescent and peripapillar atrophy, such as is frequently seen in normal myopic eyes. A central excavation of the nerve head proved to be physiologic and not glaucomatous in that it was very shallow and did not extend to the margins of the disk. The tension (fingers) was normal.

One year later (April, 1912), the condition was unchanged except that the vitreous haziness in the right eye had disappeared.

In July, 1913, his corrected vision was R. 0.6 and L. 0.8. Ophthalmoscopically, status idem.

In June, 1914, the corrected vision was R. 0.5 and L. 0.8. The pupils reacted well. Ophthalmoscopically, it looked like a distinct glaucomatous excavation within a myopic crescent. (Right = left.) Tension normal. Fields practically normal. Ordered pilocarpine.

April, 1915. Pupils react well. Both disks show positive shallow glaucomatous excavations. Tension normal. Fields slightly contracted concentrically, right more than left.

June, 1916. Corrected vision was R. 0.4 and L. 0.3.

Blood pressure, 210. Tension normal. Large peripapillar choroidal atrophy and marked increase in depth of excavation, whose walls are now nearly straight up and down—right to a greater extent than left. Relative paracentral scotoma.

July, 1916. Exitus from carcinoma of prostate with metastases.

Treatment is of but little avail. Mental quiet and avoidance of extreme physical exertion are to be recommended here as in other conditions. An increase in the blood pressure does not seem to have any marked influence upon the course of the disease. Miotics are naturally to be resorted to and I prefer a weak solution of pilocarpine. Complete miosis is of not any greater value than incomplete, and the discomforts it entails upon the patient react unfavorably. Bietti warmly advocates the use of a strong eserine solution and claims that the patients soon become accustomed to it. But I cannot recommend that course of procedure. On the other hand, diagnostic dilatation of the pupil does not superinduce an acute rise in tension with its accompanying disturbances as it will in the other forms of glaucoma; but it is best to avoid any possibility of danger from this source. Under no circumstances is operative interference to be resorted to.

How must these cases be regarded? As a disease affecting the exchange of fluids in an eyeball so predisposed that the upper limits of normal tension lie presumably below 20*mm* Hg. (cupping a result of pressure); or as a disease of the optic nerve, resulting in an excavation of the nerve head such as studied by Schnabel and Elschnig, without any marked disturbance in the exchange of intraocular fluids (cupping not the result of pressure); or as a combination of these two purely theoretical types?

Stock observed a case of typical glaucomatous excavation in a 60-year-old woman, whose visual fields were so contracted as to include completely the point of central fixation in one eye and up to within ten of this point in the other eye. The tension, taken in the hospital at frequent intervals during the period of several days and nights, never rose above 23*mm* Hg. Even after a LaGrange irido-sclerectomy, the tension remained around 17*mm* Hg. Stock concluded that this was a case wherein the upper limits of the normal tension lay under

20*mm* Hg. Fuchs concurs in this view and states that, "there are cases of glaucoma simplex in which the tension is never found distinctly increased." Furthermore, "in these cases, we must assume that the lamina cribrosa is particularly yielding so that it is forced backwards by a pressure that does not perceptibly rise above the normal limits." In support of the latter view, he argued that if such cases are dependent upon the structural differences of the lamina cribrosa (and the different degrees of development of the lamina speak for this), then the reverse must occur; *i.e.*, in spite of long-continued high tension, if the lamina is extraordinarily well-developed, an excavation will appear only very late. He recited the details of such a case and Markbreiter also described a similar one.

Orr reported a case of simple glaucoma with cupping of the disks without perceptible rise in tension and explained it by rises of pressure so slight as to be within the normal limits for the average eye. Wicherkiewicz blames an abnormal rigidity of the sclera in these cases, while Sym lays the fault upon an unduly low resistance of the nerve head.

These authors thus endeavor to explain the cases of glaucoma simplex without perceptible rise in tension by the view that, in certain eyes predisposed toward glaucoma, there occur at irregular and unstated intervals a rise in tension slightly above the limits accepted as normal. Furthermore these eyes are of such a type that moderate intraocular pressure is pathological, although for the average eye the same pressure would fall well under the upper limits of the normal. The explanation for this lies in an under-development of the lamina cribrosa, which is forced to recede.

This theory cannot explain some of the clinical or microscopical features observed and described. A shallow anterior chamber with even partial obliteration of the chamber angle or with angle adhesions, has never been reported. In other words, the canal of Schlemm is patent and no visible obstruction to the outflow of the aqueous can be seen. This, of course, may be due to the comparatively small number of cases that have come to pathological examination. In one of the few cases thoroughly examined, Elschnig found the anterior segment of the eye normal and the lamina cribrosa in its normal position.

Yet this was an undoubted case of glaucoma simplex without perceptible rise in tension. Furthermore, if the excavation were the result of pressure, relief of the relative hypertension should put a stop to the advance of the cupping; but Schmidt-Rimpler merely voiced the experience of all ophthalmologists in saying, "It occurs that the trouble in the nerve (cupping) may progress rapidly after the pressure has been relieved by operation." Acceptance of this theory alone places too great a strain upon the imagination.

The second theory is the outcome of histological examinations by Schnabel and Elschnig of glaucomatous nerve-heads. The former reported the presence of cavernous-like spaces within the head of the optic nerve, as well as behind the lamina cribrosa, in cases of glaucoma simplex. These empty spaces represented an absorption of the individual nerve fibers. In simple atrophy a similar absorption occurs, but the spaces thus caused are filled out with neuroglia, while in the glaucomatous nerves no new neurogliar tissue can be found. Ichikawa corroborated the presence of these caverns in five out of ten glaucomatous eyes examined and concluded that the changes occurred first in that portion of the nerve bearing the retinal vessels. Stock agreed as to the presence of these caverns, but claimed them not to be pathognomonic for glaucoma. He reported finding similar caverns in five cases of high myopia. But the myopic caverns are essentially different from the glaucomatous.

With this histological picture before him, Schnabel advanced the theory that the cupping in glaucoma simplex is the result of a glaucomatous disease of the optic nerve and absolutely independent of the intraocular pressure. The nature of this disease could not be determined, but it was probably of the character of a specific non-inflammatory neuritis, resulting in a breaking-down and eventual absorption of the individual nerve fibers, particularly in front of the lamina cribrosa. Lauber agreed with this view in his remarks about a case of glaucomatous cupping that extended to the edges of the disk and was accompanied by a tension of only 18*mm* Hg. But this theory is not satisfactory for all of the details of the disease.

How, then, can we explain on purely theoretical grounds

these cases of glaucoma simplex without perceptible rise in tension? Both schools unquestionably are right in certain points, but I believe that the explanation lies along somewhat different lines than either school has elaborated upon; to wit:

1. The cases now classed as glaucoma simplex without perceptible rise in tension belong, I believe, to a disease *sui generis*, that is neither a true glaucoma nor a true uveitis. My justification for this statement lies in the fact that the only points this disease has in common with glaucoma simplex are an excavation of the nerve head and an occasional rise in tension, so slight that it might well be within the normal limits. The cases reported by Fuchs, Bietti, Lauber, Elschnig, and others, as well as my own, prove these points.

2. The disease begins as a low-grade neuritis, limited to the anterior and vessel-bearing portions of the optic nerve and leading to an absorption of the nerve fibers that produces the caverns described by Schnabel. The gradual advance of this process results in the so-called glaucomatous excavation of the optic-nerve head, but requires many years for its completion. I cannot believe that this cupping is the result of pressure, for were it sufficient to produce that result (even granting a poorly developed lamina cribrosa), we would find at least a shallow anterior chamber, if not partial obliteration of the chamber angle. But both clinical and histological reports all show a normal chamber angle and patent canal of Schlemm. Furthermore, a tension sufficient to result in pressure cupping would certainly cause a pressure atrophy of the peripheral retina, which is not the case here.

3. The intermittent rises in tension are probably not the result of interference with the outflow of the intraocular fluids, but rather an increase in the secretion of these fluids. We know from the masterly work of Leber and latterly of Troncoso that the aqueous (which, after all, is the balance of intraocular pressure) is secreted at the rate of about five to six cu. *mm* per minute, and that is probably all that the flaccid lymph channels of Schlemm can take care of. Thus any marked increase in the rate of secretion would tend to carry the intraocular tension toward the upper limits of the normal and possibly above. What then is the cause of this increased secretion? In a case of this kind reported by Elschnig, there

was found, in addition to the glaucomatous process in the optic nerve, an extremely low grade of chronic uveitis, probably due to the absorption of toxins from the breaking down of the nerve tissue. This uveal irritation would account for the passing hypersecretion.

4. Treatment has practically no influence upon the course of the disease, no matter whether it be of the myotic or operative type. If the theory as proposed here be accepted, it is not difficult to see why therapeutic measures, aimed at the relief of hypertension, would be of absolutely no avail.

5. The causes of this disease lie entirely beyond our knowledge; but it is probable that some systemic selective toxin of unknown nature attacks the optic nerve of eyes so predisposed and produces the results herein depicted.

From the foregoing, I believe that I am justified in assuming that we have to deal with a disease *sui generis* that has points in common with both glaucoma simplex and chronic, clinically non-inflammatory uveitis, but still differs from both sufficiently to place it in a class by itself. Until further intimate details have been revealed by study, we have no right to give this disease a name.

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MESOTHORIUM TREATMENT OF EYE DISEASES.

By Dr. N. J. CUPERUS, Zwolle, Holland.

Translated from *Arch. f. Augenhlk.*, Vol. LXXVII., 1914.

IT is generally recognized that radium and mesothorium exert a favorable action upon certain skin diseases and tumors. Their action in eye disease is not so well known, and I am led to publish the following results with this treatment.

Case 1.—A young man, 16 years of age, was seen January 9, 1912, complaining of tearing, photophobia, gradual loss of sight in his right eye. The sight in this eye was $\frac{1}{50}$. There was a uniform opacity in the cornea, particularly in the center, circumcorneal congestion; the pupil was well-dilated after atropin; the left eye was normal. The diagnosis of diffuse scrofulous keratitis was made and the patient admitted to the hospital and treated for six weeks with the usual remedies without effecting any change in the condition of the eyes, though the subjective symptoms were relieved. On February 17, 1912, the right eye was exposed for ½ hour to mesothorium. The reaction from this treatment abated by February 28th. The cornea was somewhat less infiltrated. S. = $\frac{5}{50}$. Another application was made, lasting ½ hour. March 9th, S. = $\frac{5}{10}$, the opacity has diminished. The treatment was repeated April 3d and May 21st. The vision has improved to $\frac{5}{6}$. There is a macula of the cornea.

Case 2.—A woman 72 years of age was seen February 1, 1912, on account of headache and loss of sight following a severe pneumonia. Both eyes presented an ulcer of the cornea; in the right the ulcer was accompanied with hypopyon and dacryocystitis. Vision L. $\frac{1}{300}$, R. $\frac{1}{50}$. The condition was treated for the next six weeks by repeated paracentesis and the usual remedies. S. = R. $\frac{3}{50}$, L. $\frac{3}{50}$. March 14th, both corneal ulcers were exposed to the action of mesothorium for ½ hour. A week later marked improvement had occurred. The treatment was again practiced. March

30th, continued improvement, hypopyon has disappeared and the eyes are white. S.= L. $\frac{5}{20}$, R. $\frac{5}{60}$. There is a superficial opacity in both corneæ. The eyes are again treated with mesothorium and this is repeated April 7th. The author is inclined to believe that with this treatment applied four times very much more rapid results were obtained than by the usual methods of treatment.

CASE 3.—A man, 25 years of age, was seen for the first time, April 26, 1912. His eyes were sensitive to light and painful. The left eye S.= $\frac{5}{30}$, circumcorneal congestion, iritis, five small white nodules (like tubercles) at the pupillary margin of the iris. Vision R. $\frac{5}{20}$, a similar iritis to that found in the left eye with the presence of three tubercles. A diagnosis of tuberculous nodular iritis was made. April 29th the right eye was exposed for ½ hour to mesothorium. This treatment was repeated for the right eye May 6th. The left eye was treated May 3d and 13th. June 13th after each treatment considerable irritation, consisting in pain, tearing, and photophobia. The appearance of the eyes is very much improved. Vision R. $\frac{5}{10}$, L. $\frac{5}{20}$. The tubercles can no longer be seen. July 13th, vision $\frac{5}{10}$ in each eye. The result of the treatment in this case has been a very marked improvement in vision and the rapid disappearance of the nodules.

CASE 4.—A man, 33 years of age, has gradually lost the sight in both eyes without any symptoms of inflammation. October 12, 1912, the sight of the left eye equaled $\frac{1}{100}$. Complete posterior synechia with pupillary membrane and cloudy vitreous. Diagnosis tuberculous iridocyclitis (?) The right eye shows exactly the same changes. Treatment with sweats of no avail. Up to November 19th both eyes were exposed seven times to treatment with mesothorium, lasting ½ hour at each sitting. The remedy was directly applied to the sclera. Vision R. $\frac{5}{60}$, L. $\frac{1}{60}$. The vitreous clearer. The patient then unfortunately ceased treatment. Otherwise the result would have been much better.

In my experience hypertrophied conjunctiva in trachoma, the thickened retrotarsal fold, and the pannus are all favorably influenced by this form of treatment. Opacities of the cornea if they are treated in an early stage are amenable. The old opacities are not absorbed. Chronic blepharitis is also benefited by this form of treatment. The remedy consisted of 4*mg* contained in a little box of ebony. My specimen was examined

by Professor Koster, who found that the radiating energy equaled that of 10*mg* of radium bromide. In recent months I have carried out the treatment as follows. After the instillation of cocaine, the remedy was directly applied to the cornea for from four to fifteen minutes and directly to the sclera for from fifteen to forty-five minutes if an action was desired on the interior of the eye. The eyelids were held apart with the fingers. The time during which the application was made depended upon the reaction which the previous treatment had been followed with.

Conclusions. 1. In many cases of eye disease where the usual remedies are without avail, treatment with radium or mesothorium is favorable, particularly in chronic blepharitis, chronic inflammations of the conjunctiva, cornea, iris, or vitreous. Vision is not improved in old opacities of the cornea, although the opaque areas become less dense.

2. The proper moment at which to begin treatment is the one when nothing further can be accomplished by the usual methods of treatment. One or two treatments with these remedies are sometimes followed by a surprisingly good result.

3. If the keratitis or iritis is acute and painful, treatment with these remedies should be cautiously applied. I was not able to confirm their analgesic action.

4. Even if the eyes are kept quiet during the treatment, the application of these remedies is sometimes followed by an unpleasant irritation which may last for months, though permanent damage has never been observed.

In the first years the remedy was exclusively applied in trachoma. Cohn saw results from the application of 1*mg* radium for from ten to fifteen minutes. The granules atrophied and the conjunctiva became smooth. Selenkowsky, Darier, Thielemann, Dinger, Kardo-Ssissojew, and later Fortunati observed similar results. At the same time other names appear as opponents to radium treatment. These were Birch-Hirschfeld, Jacoby, Braunstein, and Samkowsky. They were not satisfied with the results which they obtained, and observed relapses. In 1910 Lawson and Mackenzie Davidson reported on radium treatment in eye diseases, particularly in cases of corneal ulcer, interstitial keratitis, episcleritis, pterygium, conjunctivitis, and macula corneæ. The quantity of radium

used varied from 5 to 59*mg* and the length of application was five minutes. These authors were satisfied with their results except in the case of macula corneæ.

Among the articles which have appeared in recent years, that of Professor Koster and Dr. Cathis is particularly worthy of attention. The treatment was extended to other cases; iridocyclitis, choroiditis, detachment of the retina, blepharo-conjunctivitis, and favorable results were obtained; 5*mg* of radium were applied. The length of application varied from ½ to 1 hour, and the remedy was applied as near to the affected eye as possible without directly touching it. The eyelids were held apart by the fingers of the other hand.

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EPITHELIAL NEW FORMATION AT THE CORNEAL LIMBUS WHICH RECURRED FOR FIVE YEARS AND WAS FINALLY CURED WITH MESOTHORIUM.

By Dr. KOELLNER, Würzburg.

Translated from the *Arch. f. Augenheilk.*, Vol. LXXVII., 1914.

THE following case of benign epithelial tumor of the cornea is of interest both on account of its clinical and anatomical characteristics and for its successful treatment with mesothorium.

G., 53 years of age, visited the hospital in 1908 on account of a growth which had recently appeared on the left eye. At the temporal margin of the left cornea there was a small pterygium-like growth with somewhat raised margins. The pterygium was removed. Six weeks later the patient returned with a recurrence and a similar pterygium-like scar formation was present at the temporal margin of the cornea, presenting a small raised tumor. The growth was excised and the base cauterized. In September, 1909, the patient again returned with a recurrence of the old trouble which now had extended along the entire corneal margin. The same scar tissue had formed at the temporal margin with a tumor-like thickening on the cornea. From this extended both upward and downward a pale-pink gray translucent tissue of about 4*mm* broad and 8*mm* long without new vessels. This growth projected several *mm* above the corneal surface and terminated abruptly toward the corneal center. A number of dilated conjunctival vessels were seen to pass into this growth. At the nasal margin of the cornea there was a thickening at the limbus which completed the circular tumor. The entire growth was carefully removed and the base cauterized. In November, 1910, a recurrence occurred at the temporal and lower corneal margin which was again subjected to operation but

without permanent cure. In June, 1911, the entire periphery of the cornea was covered with flat grayish hypertrophies. Down and to the temporal side thick conjunctival scars were present similar to the previous symblepharon. Operation was attempted both at this time and in January, 1912, without permanent relief. In May, 1913, a new tumor formation had appeared. The periphery of the cornea was covered with flat, raised tissue which is partly pigmented, and the adjoining conjunctiva was drawn to the tumor in a symblepharon-like process. A part of the tumor was removed for microscopic examination and beginning with July the cornea was regularly subjected to mesothorium treatment.

The favorable results which Agricola[1] has recently reported in a case of papilloma of the corneal margin suggested this line of treatment. 10*mg* mesothorium was employed, contained in a small box of hard rubber. The capsule was directly placed upon the cocainized conjunctiva and each part of the tumor was attacked for from one to three minutes. This necessitated six different applications at each sitting. The applications were undertaken daily for eighteen days without producing any inflammatory reaction on the part of the conjunctiva. The tumor showed no change. Perhaps there was a gradual flattening. At the termination of the treatment the patient was allowed to go home without any particular change in the condition. Five months later the patient returned for observation and the tumor had entirely disappeared. The eye was free from irritation. The enlarged conjunctival blood-vessels had practically disappeared. The site of the old tumor was occupied by a very thin grayish scar tissue with a smooth surface through which the iris markings could be seen. The conjunctiva still presented some abnormal pigmentation. The symblepharon was unchanged. The condition three months later was again found to be satisfactory and there was not the slightest sign of any recurrence.

The microscopic examination showed that the tumor was without blood-vessels, consisting of epithelial depressions with scanty intervening tissue. The benign character was shown by the fact that the epithelial prolongations never penetrated

[1] Agricola, "Papilloma of the Conjunctiva," *K. M. f. A.*, vol. li., p. 650, 1913.

the underlying connective tissue in typical malignant fashion but were everywhere sharply defined. They were prolonged irregularly so that they sometimes were cut in transverse section. They presented a tubular structure which was not everywhere solid. Mucous cells were frequent and cystic cavities resulted from their continued activity. These cells sometimes were grouped together to form large cavities which were surrounded by a row of cells similar to what is found in the so-called cystic nævi. These cavities were found particularly at the margin of the tumor in the direction of the connective tissue. Epithelial depressions begin at some distance from the true tumor. In the center of the true tumor the layer of cells over the epithelial depressions becomes thin and sometimes is absent. The intervening tissue between the epithelial indentations is filled with numerous round cells, particularly in the region between the epithelial tumors and the connective-tissue stroma where they form a separating layer. This layer of round cells also forms a protecting wall. The subepithelial connective tissue is normal. At the margin of the tumor a basal membrane can be recognized upon which the epithelial cells are placed. Pigment is found in the cells and there are groups of epithelial cells which are completely filled with yellowish-brown pigment grains. This benign epithelial tumor shows a characteristic clinical picture in its curious extension along the margin of the cornea and the peculiar distinct scar-tissue formation, aside from its slow benign though recurring course. This distinguishes the case from that of the progressive form of nævus, though it resembles the latter if the conception of nævus is taken in the broad sense of some authors.

The papillomata which occur at the corneal limbus present an entirely different picture though they may recur in this same obstinate manner. In these we see blood-vessels penetrate from the depth into the individual papillæ in a typical comet-like manner. They present a lobular structure which is sharply defined, and have a characteristic macroscopical appearance which was absent in this case.

After removal of these tumors their loose connection with the surrounding tissue is often noticeable. Anatomically this tumor presents other resemblances to the nævi from the

characteristic formation of epithelial prolongations, mucoid cells, and cystic degeneration. The lymphoid character has also been described in the case of nævi (Reiss). Epithelial prolongations in the truly pigmented and unpigmented nævi of the conjunctiva occurred, however, only at the margin of the tumor. They are present in some of the marginal sections but do not occur in all the sections as they did in the above described case.

It is, of course, difficult to exactly define the limit between these various new formations, and it is possible that some would classify this case among the benign epitheliomata and the telangiectatic angiomata, as was recently described by Landstroem and Wolfram. This epithelial tumor can be distinguished from the papillomata on account of its slight vascular supply in the intervening tissue and the distinct indentations of the epithelial processes below the surface, while in the papillomata papillary elevations above the epithelial level are characteristic. Cutaneous horns are always absent. The picture resembles somewhat the epithelial hypertrophies which Wessely and others found experimentally after treating the scleral conjunctiva in rabbits with scarlet red. In these cases it was also noticeable that the tumor grew along the margin of the cornea. This curious localization of the tumor is probably explained by the histological conditions where the corneal epithelium is transformed to that of the conjunctival type. The basal cell layer which directly adjoins the propria is of importance for the development of epithelial prolongations, and in this region the cylindrical type is replaced by the cubical one. Normally in this region small epithelial depressions and elevations of the propria may be found.

In this case the new formation may have developed from the pterygium. Papillomata at the corneal limbus though they present a different anatomic picture occur, as is well known, in tissues which have been changed through the presence of a pannus or other chronic inflammatory changes with increased vascularization. The reason that these tumors recur is given by the epithelial depressions which are found to exist quite beyond the limit of the true tumor in apparently normal conjunctiva, a point which Wolfram particularly pointed out in the case of conjunctival nævi.

The excellent results from the mesothorium treatment confirm Agricola's experience. In this case the same immediate absence of improvement was noted, then the remarkable disappearance of the tumor was observed five months later. The cosmetic result was an unusually favorable one, aside from the remaining pigmentation, and the corneal scars are so thin that a fairly satisfactory visual result could be obtained if the pupillary margin of the cornea is also involved. The remarkable annular extension of the tumor made a satisfactory surgical treatment almost hopeless. The freedom of recurrence for eight months gives every prospect of a cure.

PERIPUPILLARY COMBINED CYSTOTOMY.

By Prof. FALCHI, Director, University Eye Clinic, Pavia.

Translated from *Arch. f. Augenheilk.*, Vol. LXXVII., 1914.

SECONDARY cataract not only interferes with the function of the eye but also exerts a marked influence on the anterior part of the uvea and on the vitreous humor. It is therefore necessary in operating for this condition that the operative trauma is reduced as much as possible and that this trauma be limited to the secondary cataract, avoiding any injury to the iris and to the vitreous. In this connection it is necessary to remember that the secondary cataract is adherent to the iris in many cases by means of posterior synechia and often to the vitreous body, particularly if during the first operation loss of vitreous occurred. Adhesions of the secondary cataract to the iris cause an immobilization of a part of the pupil as well as to the margins of the coloboma, and the transverse diameter of the iris is usually held rigid and tense. This is particularly shown by the observation that after making a vertical incision or a crossed incision or after extraction of the secondary cataract the pupillary opening dilates in the line of the transverse horizontal diameter.

I have been in the habit of operating for secondary cataract in the following manner and think that the term "peripupillary combined cystotomy" is the best definition of this procedure. The instruments that are necessary, in addition to the lid elevator and fixation forceps, are a keratome, a cystotome (v. Graefe) with my modification, Forster's capsule forceps, and a curved iris forceps. At the operation after the eyeball has been fixed an incision is made at the corneal limbus in the upper and outer quadrant with the keratome. The cystotome

is then introduced into the anterior chamber and the secondary cataract is divided by outlining this membrane just within the pupillary margin of the iris, care being taken not to injure the iris. The secondary cataract is divided at the pupillary margin and at the margin of the iris coloboma with the exception of one small peripheric part which serves as a support for the now freed secondary cataract. A capsule forceps or a curved iris forceps is then introduced and the secondary cataract is extracted. A pupillary opening then results which is perfectly black. Occasionally a small remnant of secondary cataract remains at the upper margin. The operation for secondary cataract when no iridectomy has been performed would be carried out in the same manner, the incision being made slightly within the pupillary margin.

The recovery after this operation takes usually ten days. The satisfactory result is shown both by the examination with the ophthalmoscope and the functional tests. It is well not to undertake this operation short of six weeks after the primary extraction. In the last two years I have operated upon 21 cases according to this method. Of these, senile cataracts were represented by 11. The improvement in vision occurred in all with the exception of one case. In 2 there was a slight escape of vitreous without any other complication. Operation was performed in 4 cases of juvenile cataract and the vision was improved in all cases but one. There were no post-operative complications. The operation was also performed in 6 cases of traumatic cataract. The vision in these was improved except in 2 in which it remained the same.

If peripupillary cystotomy is attempted in that form of secondary cataract characterized by fine web-like opacities, this web-like tissue may after the cystotomy sink back behind the iris, leaving a large black pupil. Under these conditions it is advisable not to extract this tissue in order to avoid complications on the part of the iris and of the vitreous. This precaution should also be followed when vitreous has been lost at the first operation and adhesions have formed between the secondary cataract and the vitreous on the one hand, and the iris on the other. The extraction of the secondary cataract under these circumstances would entail a fresh loss of vitreous. I have the records of four cases performed after extraction of

senile cataract with loss of vitreous. In these vision was improved in all.

Herman Knapp described the following procedure in secondary cataract when the pupillary area and the iris coloboma are occluded. The knife needle is introduced and along the lower margin of the iris the secondary cataract is incised, separating this membrane from the iris. A clear space then develops between the lower margin of the secondary cataract above and the pupillary margin below. In my hands this method has not given me favorable results and I have not been able to obtain a sufficiently large pupillary opening. Nor did I succeed in observing that the secondary cataract after its separation from the lower margin of the iris retracts sufficiently to form a clear opening as Knapp reports.

I consider this result as exceptional and unusual and think it probable that this opening is not so much the result of a retraction of the secondary cataract as it is due to the action of the mydriatic. The opening therefore is again lost as soon as the mydriatic action is over and the very small opening is likely to be again occluded by fresh inflammatory processes and a visual improvement does not take place.

In the performance of this peripupillary combined cystotomy, I have modified v. Graefe's cystotome in order to avoid loss of vitreous. The injury to the vitreous in discissions is usually the result of incisions which penetrate into the vitreous body, as must occur in the use of most needles and even the knife needle. It is impossible with these instruments to limit the cutting to the thickness of the secondary cataract, and not only the secondary cataract but also the vitreous is incised. The thickness of the secondary cataract varies. I have found it in its thinnest part to measure 0.2 to 0.5*mm*. In its thickest part it varies between 0.6 and 1.3*mm*. Most cystotomes vary in the length and the cutting breadth of the cutting part of the instrument. According to Luer, the classical cystotome of v. Graefe should have a projection 0.5 to 1.5*mm* long and its breadth varying from 0.25 to 0.9*mm*. The incising and cutting cystotomes have a cutting edge which is directed downward. The length of this projection in the instruments made by Weiss is usually 1 or 1.2*mm*. Its greatest breadth is 0.5. I have had Weiss make the cutting projection in the cystotome

0.8*mm* long, its cutting surface being directed down and slightly curved. I believe that with this instrument it is possible to cut deep enough to separate the secondary membrane from the peripupillary iris without damaging the vitreous.

I have come to the following conclusions. This method of operating combined with the extraction of the secondary cataract is a procedure by which (1) we obtain a pupillary opening sufficient to restore sight without causing any further complications; (2) this procedure should be used in cases of secondary cataract in which there was no loss of vitreous at the primary operation; (3) in case of vitreous loss the procedure is the same except that the secondary cataract is not extracted.

A CASE OF PITUITARY BODY DISEASE AND THE RESULTS OF GLANDULAR ADMINISTRATION.[1]

By G. E. de SCHWEINITZ, M.D., and H. W. HOW, M.D., of Philadelphia.

(*With 11 figures on Text-Plate* II.)

DISCUSSING the value of glandular administration in pituitary body disorders, Harvey Cushing[2] points out that for a number of years attempts had been made to apply Brown–Sequard's principle of organotherapy in the treatment of acromegaly. The results were occasionally beneficial, often they were negative, and sometimes detrimental. This variation, as he further points out, is now understood, for it is only when there is a stage of glandular insufficiency that pituitary feeding can be of service.

As is well known, the advantage of glandular feeding has been demonstrated by Cushing experimentally, and in his large collection of case histories excellent examples of marked improvement under the influence of continuous organotherapy are recorded, and similar records may be found in the literature of this subject here and abroad. The studies which have been made, especially by Cushing, render it less difficult to identify those cases suited to glandular feeding than was formerly the case, but the difficulty is by no means obviated. Because pituitary body malady is a polyglandular one, to quote Cushing's words, the administration of extracts of glands other than the one primarily involved may be of service, notably

[1] This paper, now considerably elaborated, was presented to the Ophthalmic Section of the College of Physicians of Philadelphia on April 20, 1916, but has not been published, except in a brief abstract. (*Ophthalmic Record*, February, 1917.)

[2] *The Pituitary and Body its Disorders*, p. 315, J. B. Lippincott Co., 1912.

the extract of the thyroid gland, and while the rational remedy is pituitary body extract, thyroid feeding must not be neglected, and, as is illustrated in the case report which follows, the combination of pituitary body extract and thyroid feeding may be advantageous.

As this paper is simply intended to be a record of personal experience in this line of treatment, no further reference to the literature is made. Two other cases of successful organotherapy one of us (Dr. de Schweinitz) has reported.[1] Briefly summarized, they were as follows:

CASE 1.—An unmarried woman, aged 39, with evident tumor of the pituitary body, demonstrated by X-ray examination, had complete bitemporal hemianopsia followed by absolute blindness lasting twelve days in the right eye and six weeks in the left, followed by entire restoration of the vision of the right eye and nearly complete restoration of the vision of the left eye under the influence of large doses of thyroid extract associated with inunctions of mercury.

CASE 2.—An unmarried woman, aged 18, with some symptoms indicating pituitary body disease and an X-ray examination not entirely satisfactory but certainly suggestive of an affection of the hypophysis, had, associated with a moderate choked disk when she came under observation, complete blindness of the right eye lasting one week and partial blindness of the left eye, with loss of the nasal field. Under the influence of the administration of thyroid extract, associated with inunctions of mercury, the visual function of both eyes was restored to the normal standard.

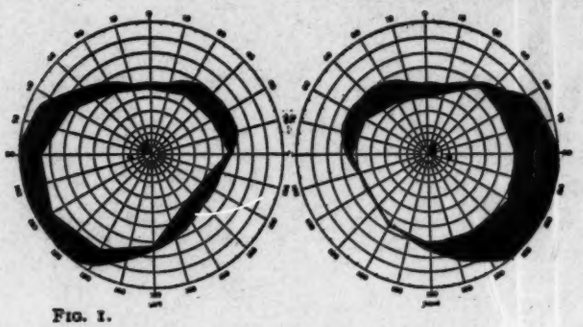
What influence the inunctions of mercury may have had in these circumstances is not quite clear, inasmuch as the usual examinations indicated the absence of luetic infection.

The case history of the patient now under consideration follows:

An unmarried woman, a trained nurse by occupation, when she came first under observation, namely, in November, 1899, was 36 years of age. She sought relief from an ordinary eyestrain headache. The eyegrounds were entirely normal. The correction of a simple hyperopic astigmatism yielded

[1] "Some Remarks on the Ocular Symptoms of Pituitary Body Disease and the Results of Treatment, being a Clinical Paper Illustrated with Three Case Histories." *Pennsylvania Medical Journal*, April, 1912.

To Illustrate Dr. de Schweinitz's Article on "A Case of Pituitary Body Disease and the Results of Glandular Administration



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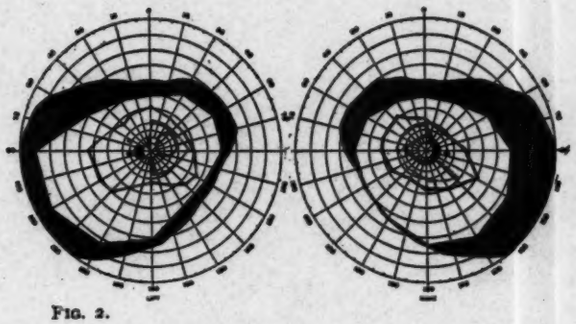

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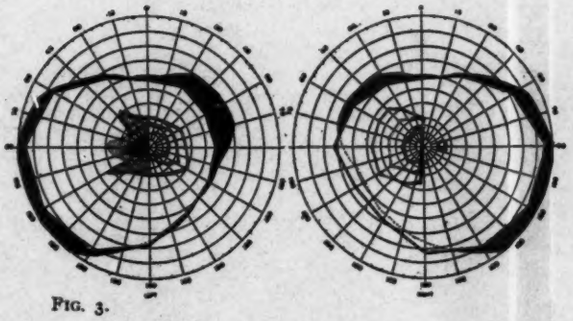

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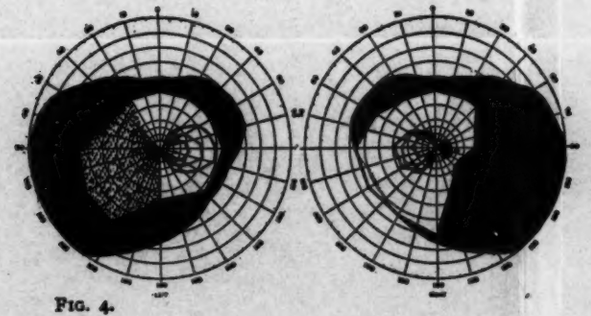

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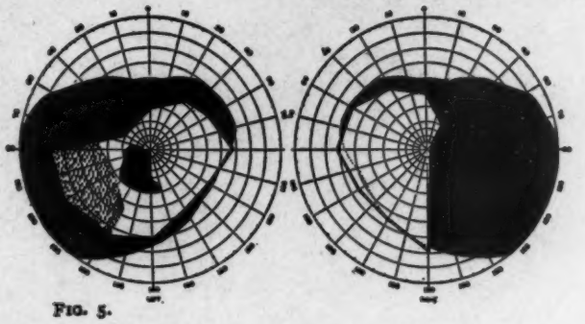

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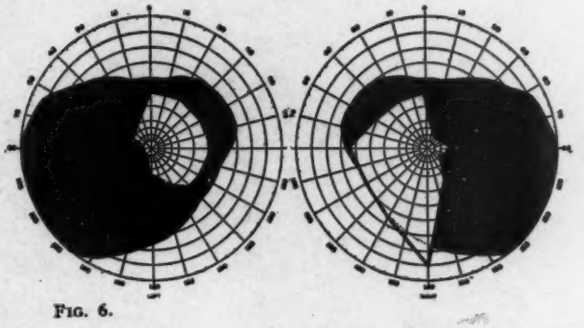

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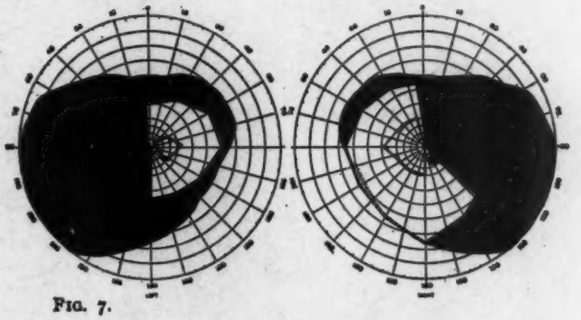

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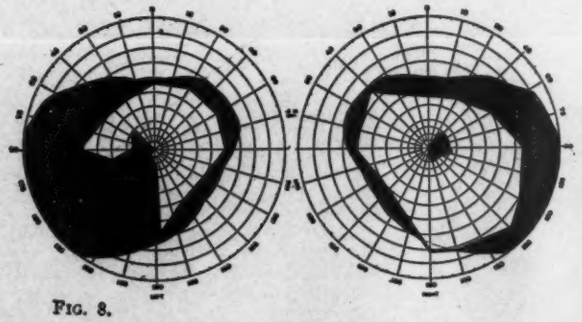

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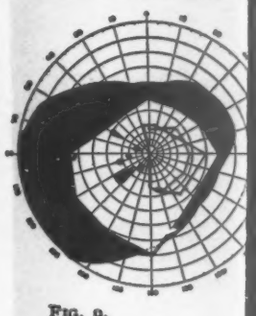

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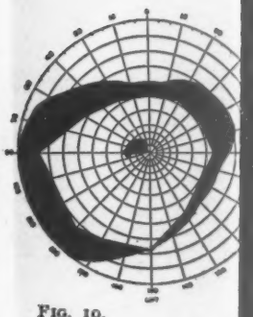

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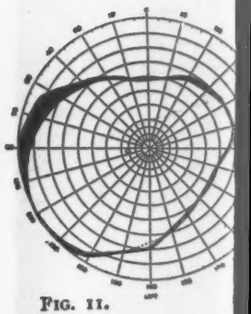

Fig. 11.

Fig. 1.—Small paracentral scot
Fig. 2.—Increased size of para
for red and green
Fig. 3.—Right eye, complete t
almost complete temp
faint color perception,
Fig. 4.—Complete bitemporal
complete hemianopsia
where form is still dim
Fig. 5.—Right temporal hemia
poral slant; marked in
gradually progressing
Fig. 6.—Complete bitemporal
Fig. 7.—Right temporal hemia
complete temporal he
Fig. 8.—Right eye, increasing
to the temporal side o
from hemianopsia.
Fig. 9.—Showing, right eye, i
eye, still partial color
scattered through the
Fig. 10.—Right field almost
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Fig. 11.—Complete return of

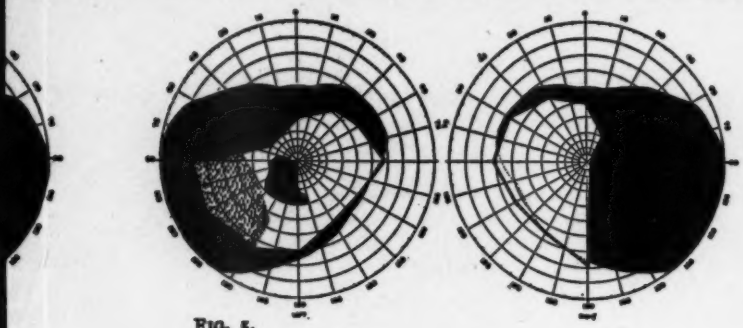
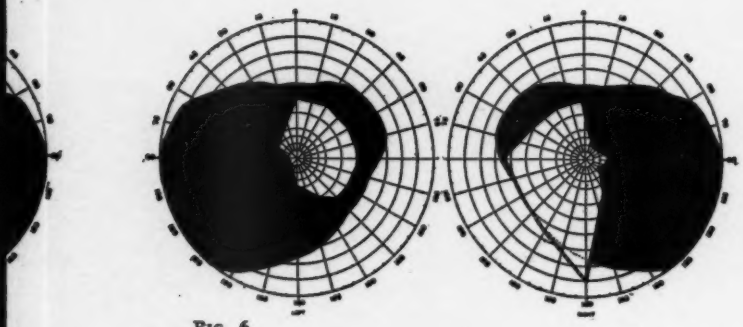


FIG. 5.

FIG. 9.



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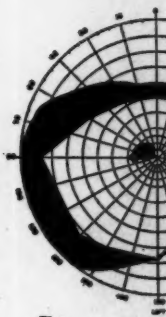

FIG. 10.

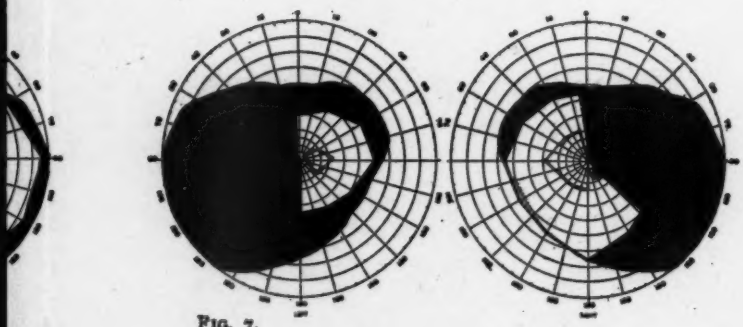

FIG. 7.

FIG. 11.

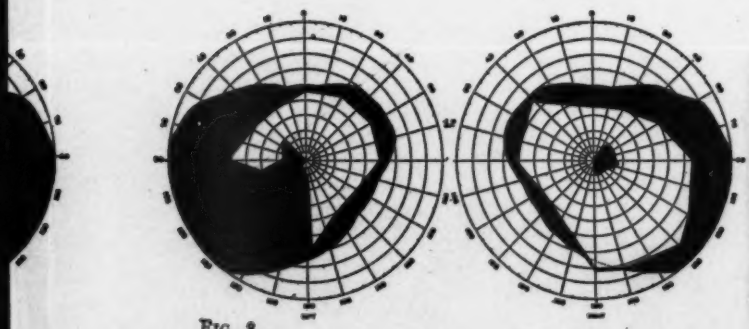

FIG. 8.

FIG. 1.—Small paracen
FIG. 2.—Increased size
for red and gr
FIG. 3.—Right eye, co
almost comple
faint color per
FIG. 4.—Complete bite
complete hem
where form is
FIG. 5.—Right tempor
poral slant; m
gradually pro
FIG. 6.—Complete bite
FIG. 7.—Right tempor
complete tem
FIG. 8.—Right eye, in
to the tempor
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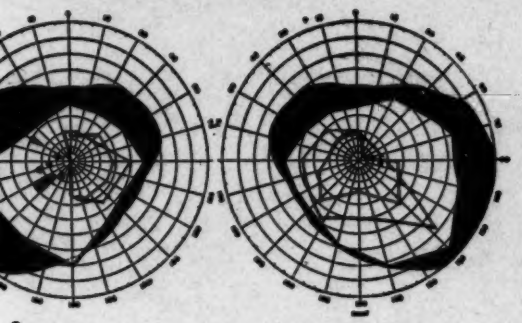
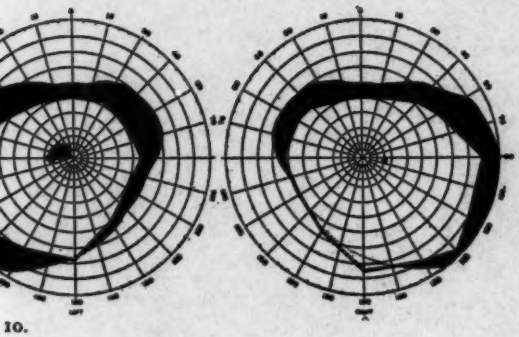
FIG. 9.—Showing, righ
eye, still parti
scattered thro
FIG. 10.—Right field
tracted, with
FIG. 11.—Complete re

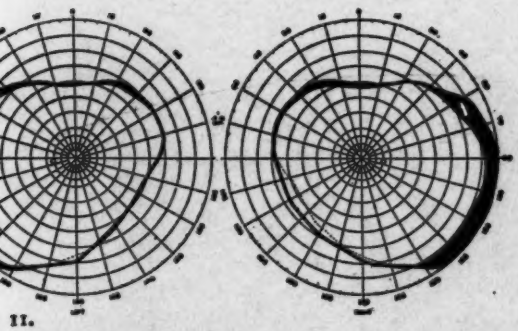
AR ADMINISTRATION."



9.



10.



11.

ll paracentral scotomas; moderate concentric contraction.
eased size of paracentral scotomas; bitemporal hemianopsia
red and green
ht eye, complete temporal hemianopsia for colors; left eye,
ost complete temporal hemianopsia for colors, with areas of
t color perception, and large hemianopic scotoma.
nplete bitemporal hemianopsia; paracentral scotomas; almost
nplete hemianopsia for form, with a large area in the left field
ere form is still dimly preserved.
ht temporal hemianopsia; left partial hemianopsia, with tem-
al slant; marked increase in the temporal scotoma, which is
dually progressing to meet the darkening temporal field.
nplete bitemporal hemianopsia.
ht temporal hemianopsia with recovery beginning below; left,
nplete temporal hemianopsia.
ht eye, increasing reestablishment of visual field; scotoma
he temporal side of fixing point; left eye, beginning recovery
n hemianopsia.
wing, right eye, increasing recovery from hemianopsia; left
, still partial color hemianopsia, with islands of color vision
ttered through the field.
ight field almost restored; left field still concentrically con-
cted, with a temporal scotoma.
omplete return of fields almost to standard size.

satisfactory results. She came from time to time, when the need of change of glasses was evident, but it was not until the 10th of June, 1914, that any departure from normal visual acuteness was noted, or any alteration in the previously healthy appearance of the eyegrounds. At this time, after a period of severe headache, blurred vision occurred: O. D. $\frac{5}{60}$, O. S. $\frac{5}{15}$. Both disks had a distinctly atrophic pallor, and in the visual field of the right eye a paracentral scotoma was evident. In these circumstances a very careful study of all conditions was made in association with Dr. D. J. McCarthy and her physician, Dr. William Marshall. The records follow:

Family History.—The patient's father died at 63 years of age with symptoms which indicated that the cause of death was angina pectoris. During his entire life, it is stated, he had had "liver trouble." The patient's mother is living, but has rheumatoid arthritis. Three brothers are living and well. One brother died of typhoid fever at the age of 28, and another brother died during infancy. One sister is living and well. The patient's maternal uncle died of apoplexy. There is a distinct history of tuberculosis in the family, and the mother at one time had a lump removed from her arm which is said to have been a cancer.

Patient's History and Past Medical History.—The patient is American-born, had the usual school education, and for six years, that is, from the time she was 18 until the time that she was 24 years of age, she herself taught school, an occupation which she detested. In her later life, presumably after she became a trained nurse, her habits of sleep were extremely irregular. Her food ordinarily was of proper quality and quantity, and apparently usually well digested, although there is a history of periods of hepatic disturbance and, as shall presently be noted, extreme constipation. Until she was 50 years of age she consumed a great deal of candy, but since that time has practically abandoned the candy habit. During the years that she was an active nurse her work was arduous, as it was also when in later life she became an assistant in a tuberculosis dispensary. Exercise, however, she has always faithfully carried out, often taking long walks, sometimes twelve miles daily. She has had several severe nervous shocks,—an accident to her uncle, the sudden deaths of her father and of two sisters-in-law, and has herself met with one accident, when a horse ran away while she was with a patient who suffered from mental disease. She herself was not hurt, but her anxiety lest her patient might have been injured was depressingly great.

Menstruation was established when she was 14 years of

age, and occurred, until its cessation, every twenty-four days, often being associated with pain so intense that she fainted. The periods were always prolonged. Menstruation ceased at the age of 49, or at least practically ceased, but in the year prior to this the period had occurred only four times.

During a great portion of her life she has suffered most severely from headaches. These began with violence when she was 20, but there is a history of severe headaches at irregular periods prior to this time. When they first began these headaches would last for an hour, but later on in her life continued for a day at a time, and were sometimes associated with violent nausea and vomiting. At first the eyes were uninvolved, but later, that is, about five years after this type of headache began, ocular pain was a common symptom. She also gives a history of what is termed neuralgia, particularly in the left temporal region, and quite diffuse over the left side of the face.

There is a clear history of rheumatism, especially in the knee joints, between the 17th and 18th years. This disappeared until twelve years before she came for the examinations which have been detailed, when it reappeared irregularly but yielded rapidly to sodium salicylate treatment. It returned again, and was especially active in the knees, elbows, and shoulders during two years prior to the disturbance of the eyesight for which she sought relief.

The patient seems to have had no difficulty with the bladder, but for some months prior to her examination the urine, which ordinarily had been of apparently healthy quantity and quality, became as colorless as water, but there was no polyuria.

All her life, that is, until she was about 50 years of age, she was exceedingly constipated. The cure of this condition she attributes to a course of massage.

There is no history of disease of the heart, lungs, or abdomen.

Five or six weeks prior to her examination in 1914, she began to notice severe numbness in the hands, coming in periods varying from once to eight or ten times a day, and first observed in all the fingers and the thumb of the left hand; subsequently the right hand was similarly affected. Somewhat relieved and controlled by electric treatment, it did not disappear entirely, and for more than a year before her examination, using her own expression, "she dropped everything she touched," a misfortune which she attributed to her inability "to feel things." Close questioning indicated that this awkwardness, if it may be so described, began at an earlier period in her life, two or three years before her examination.

As a child the patient had scarlet fever, pertussis, and chicken-pox. When 25 years of age she acquired measles, and this was followed by erysipelas of the face.

From the time that she was a small baby until she was four years of age she had a number of convulsions associated with unconsciousness. The nature of these and their etiology she does not know. They were attributed by the doctor in charge to stomachic disturbance, and seemed to have been associated with mental irritability. Only once in adult life does it appear that she had anything like a convulsion. This occurred while assisting in an operation during her training, and the seizure had as sequels temporary deafness, disturbed vision, and inability to move.

General Examination.—At the time of examination, namely, June 10, 1914, the patient's skin was in good condition; there was a slight chronic catarrhal pharyngitis, but the tonsils were normal, and the ears unaffected. There was no demonstrable arteriosclerosis, and examination of the heart, lungs, and abdomen failed to reveal any abnormality. There has been no unusual gain in weight. With the eyes closed the station was slightly uncertain; with the eyes open, quite good. The coördination of the hands was normal, and her muscular power normal, and although the muscles were soft, there was no atrophy. Knee-jerks and biceps and triceps jerks were equal and normal. There was no astereognosis. A few spots of tenderness along the spine were discovered. The thyroid was palpable upon the left side and the isthmus was placed low in the suprasternal notch. Adenopathy was absent. There was an area of hypæsthesia to touch, in the palms of both hands, as well as from the middle of the forearm and extending all over the arm. The teeth were in good condition.

Examination of the urine yielded the following results: Dark amber color; acid reaction; specific gravity 1025; absence of albumin and sugar; no excess of indican. Microscopic examination negative, except for a few leucocytes and many urates.

The blood examination yielded the following results: Hemoglobin 97 per cent.; red blood cells 4,870,000; white blood cells, 7920. Wassermann reaction (blood serum) negative.

An X-ray examination showed a marked enlargement of the pituitary fossa, with deepening of the pituitary pit and decided thinning of the posterior clinoid processes.

Ocular Examination.—6.10.14. V. O. D. $\frac{5}{5}$; O. S. $\frac{5}{10}$. No abnormality of the ocular rotations, nor of the pupil reflexes; each optic disk exhibits marked pallor, especially in the temporal half. Fields of vision taken on that day and

one week later indicated, in addition to moderate contraction, paracentral temporal scotomas. (Fig. 1.)

7.20.14. V. O. D. $\frac{8}{10}$; O. S. $\frac{8}{15}$. Increased contraction of the visual field; increased size of the paracentral scotomas; bitemporal hemianopsia for red and green; blue field contracted but not hemianopic; distinct and rather typical temporal slant; glandular feeding begun (Fig. 2), pituitary body extract (anterior lobe) and thyroid extract, grs. 2½ each, t. i. d.

9.8.14. V. O. D. $\frac{8}{9}$—a marked improvement in visual acuteness. O. S. $\frac{8}{30}$—a marked decrease in visual acuteness. Right eye, complete temporal hemianopsia for colors; left eye, partial hemianopsia for colors. (Fig. 3.)

11.23.14. V. O. D. $\frac{8}{7.5}$; O. S. $\frac{8}{9}$. Complete bitemporal color hemianopsia; paracentral scotomas as before; almost complete hemianopsia for form. (Fig. 4.)

12.10.14. V. O. D. $\frac{8}{7.5}$; O. S. $\frac{8}{100}$. Marked atrophic pallor on the surface of each disk, the grayness particularly noticeable in the deeper layers.

Up to this date the patient has taken 400 2½-grain tablets of thyroid extract, and 200-2½-grain tablets of pituitary body extract, and has received 58 one-drachm inunctions of unguentum hydrargyrum, which were discontinued after this date. The visual field of the right eye shows almost complete temporal hemianopsia, and of the left eye a typical temporal slant with a large area of hazy vision and a paracentral scotoma increasing outward and downward. (Fig. 5.)

1.11.15. V. O. D. $\frac{8}{9}$; O. S. $\frac{8}{8}$. Headache entirely relieved, and has not been present for a long period of time; practically complete bitemporal hemianopsia, with marked contraction of the preserved field of the left eye. The paracentral scotomas are no longer demonstrable. (Fig. 6.)

3.8.15. V. O. D. $\frac{8}{9}$; O. S. $\frac{8}{150}$. Complete temporal hemianopsia of the left eye; beginning recovery from below of the lost temporal field of the right eye (Fig. 7). No Wernicke pupil phenomenon was demonstrable at any time during the period of the hemianopsia.

4.12.15. V. O. D. $\frac{8}{9}$; O. S. $\frac{8}{8}$. Partial recovery of the lost field of the right eye, but a large paracentral scotoma which had not been demonstrated in several previous examinations. Beginning recovery of the left field, in this instance from above. (Fig. 8.)

During the late spring and summer of 1915 the patient was not examined, although heard from at intervals, the reports always being encouraging. The next careful examination was made:

10.18.15. V. O. D. $\frac{8}{9}$; O. S. $\frac{8}{8}$. The disks were still

pallid; the bitemporal hemianopsia for form had departed, and recovery of the color field in the right eye was beginning from below. In the left eye complete hemianopsia for blue and red, with islands of red and blue perception in the darkened field. (Fig. 9.)

1.24.15. V. O. D. $\frac{8}{8}$; O. S. $\frac{8}{12}$. Field of vision of the right eye for form nearly standard; of the left eye almost standard with, however, a paracentral scotoma up and out (Fig. 10). Disks still pale, but patient entirely comfortable.

10.9.16. V. O. D. $\frac{8}{8}$; O. S. $\frac{8}{8}$. Both fields of standard size.

2.5.17. V. O. D. $\frac{8}{8}$; O. S. $\frac{8}{8}$. Visual fields practically of standard size, no scotomas found after a most careful search (Fig. 11).

The patient has continued, in somewhat modified dose, to take the thyroid and pituitary body extracts until the present time. If they are omitted, her headache returns. Since July, 1914, she has consumed, approximately, 2100 tablets (2½ grains each) of thyroid extract and of pituitary body (anterior lobe) extract.

An X-ray examination (2.7.17) by Dr. Pancoast revealed the following conditions: The sella turcica is quite large, but there has been no actual destruction of the walls. There is no encroachment upon the sphenoid sinus.

DISCUSSION.

In general terms, the patient conformed to none of the well-recognized types of disorder of the functions of the pituitary body. That an affection of the hypophysial region existed was made evident by the X-ray examination, the perimetric deviations, and the effect of glandular feeding. Suggestive symptoms were the long periods of intense headaches and their relief under the influence of organotherapy, neuralgic pain over the left temporal region and left side of the face, numbness of the hands, themselves, however, devoid of abnormality, and the awkwardness in their use.

The development of the visual field phenomena was interestingly characteristic. Beginning with bitemporal paracentral scotomas, the changes proceeded steadily through the stages of partial color hemianopsia, total color hemianopsia, and complete hemianopsia for form and colors. The restoration of the field, at least of that of the right eye, was chiefly from below. The appearances of islands of color perception in the field of the left eye (Fig. 9) prior to the reëstablishment of

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the entire color-perceiving area represents a phenomenon which has not infrequently been observed.

Significant and interesting is the fact that in the period from 6.10.14 to 1.11.15, during which the visual acuteness of the right eye was steadily improving, that of the left was equally steadily declining, although treatment was proceeding vigorously. The decline of the vision of the left eye continued for two months after the right eye had regained full visual power. After that date improvement began, but standard vision was not obtained eighteen months later. A similar condition of affairs is often observed during the treatment of specific interstitial keratitis. Whether any therapeutic value should be ascribed to the inunctions of mercury, which were used vigorously in two patients whose histories have been previously published and which are summarized in the beginning of the paper, is uncertain; certainly the answer to the query cannot come from any knowledge we possess of their physiological action, inasmuch as syphilitic taint was definitely excluded. These inunctions were also used for a short time during the treatment of the third patient, but it would seem that to glandular feeding the chief effect should be attributed.

ATROPHYING CONJUNCTIVITIS WITH SYMBLEPHARON.

By Dr. R. KUEMMELL, Erlangen.

Translated from the *Arch. f. Augenhlk.*, Vol. LXXVII., 1914.

ANY process in which opposing parts of the conjunctiva are denuded of their epithelium may lead to a union of these raw surfaces with the formation of symblepharon. This is usually the result of an injury, especially after burns or cauterization. Another cause are the diseases in which deep destruction of the epithelium occurs, as that rare form of diphtheria of the conjunctiva which is produced by the diphtheria bacillus. This form is unusually uncommon; in over 30,000 patients we have seen only one true diphtheria of the conjunctiva where an associated affection of the nose, pharynx, larynx, and trachea led to death. The other forms which resemble diphtheria and are produced by other bacteria lead to cicatricial contraction in only the most advanced cases. Smallpox causes symblepharon. Fortunately this is even less frequent than diphtheria. The formation of an abscess may lead to an adhesion of the opposing layers of the conjunctiva. This holds particularly for processes at the angles of the lids. Other unusual causes are tuberculous and syphilitic ulcers, anthrax, erysipelas, and similar conditions. Symblepharon is more frequent after pemphigus of the conjunctiva where complete adhesions of both lids occur later in life. This is generally associated with the shrinking of the conjunctival sac. In trachoma the conjunctiva shrinks, causing symblepharon which should be properly classified as a posterior symblepharon. Between the lid and the eyeball folds of scar tissue extend which may advance up to the margin of the lid and

divide the conjunctival sac into various departments through the formation of septa. This is particularly observed in certain rare forms of trachoma where the progress of the disease is an unusually slow one, and frequently the patient is not seen before the cicatricial stage.

Symblephara are seen in a form of chronic conjunctivitis characterized by shrinking of the conjunctiva and in no way related to trachoma. This conjunctivitis with symblepharon is not generally recognized. It has seemed worth while to draw renewed attention to it. The literature does not contain any reference to this, and in the most recent article on symblepharon, the thesis of Bonté (*Thèse de Lille*, 1905), no mention is made. The condition occurs in old people of either sex who live in the country and who have spent a great deal of their time out of doors in all kinds of weather. It is well known that under these conditions chronic conjunctivitis is nearly universal. This conjunctivitis is seen in various grades, and it is usually the discomfort which it causes which brings the patient to the physician. The patients complain of a pressure, of a burning, and of lacrimation. Finally in the extreme cases the entropion and the corneal complications are the troublesome factors. In general the patients will state that they have had poor vision for many years and that the conjunctivitis has bothered them from time to time. Occasionally in the mild forms there may be no discomfort, and the condition will be found accidentally in determining glasses. In these mild cases the characteristic signs are well marked. The conjunctiva in general is thin and smooth, particularly in the lower lid. The upper lid does not show any changes. In the later stages the conjunctiva assumes the aspect which is so frequently seen in chronic trachoma. It is smooth, of a pale pink color, occasionally white, giving one the impression of a very faint pseudomembrane, as after a mild cauterization. On the eyeball the conjunctiva will be drawn in wrinkles. The conjunctival sac shows a varying degree of shrinkage. The semilunar fold and the caruncle early suffer from the general atrophy, so that the semilunar fold loses its sharp margin and its color changes to a pale pink or white appearance.

A similar condition is observed in a beginning pterygium. The caruncle is diminished in size and is often transformed

into a small yellowish-red spot. It sometimes is distorted just as it is in the presence of a pterygium. Pinguecula and pterygium are frequently present. A characteristic symptom is the formation of an adhesion between the lid and the eyeball. This adhesion is symmetrical in both eyes, particularly in the region of the lower lacrimal point. On everting the lid a sharply defined fold of conjunctiva will be seen extending to the eyeball near the cornea. This symblepharon can also appear in other places, particularly in the later stages. Sometimes the adhesions are multiple, and numerous folds will be present between the eyelids and the eyeball. These adhesions are much less frequent in the upper lid, though in one case it was present and then extended to the region of the upper lacrimal point. The other changes are not characteristic and are those which appear in all prolonged chronic conjunctivitis cases. The margin of the lid becomes thickened, inverted in various degrees with consequent involvement of the conjunctiva and of the cornea. The only other condition which is likely to be confounded with this is trachoma which may cause a similar diffuse atrophy of the conjunctiva with contraction. The characteristic scars in the upper lid of trachoma are, however, absent. The cornea is not involved in a similar manner and particularly the lesions in this form of conjunctivitis are usually in the lower part of the cornea and not in the upper. The curious adhesions which occur in the neighborhood of the lower lacrimal point might suggest a pterygium. It is curious to note how frequently this symblepharon occurs if one is on the lookout for it.

In one year we saw seven examples. The following cases illustrate varying degrees of this affection:

B., 67 years old, consulted us on account of presbyopia. The semilunar fold is atrophic, pale pink; the caruncle is very small; conjunctiva is thin and smooth. There is a narrow symblepharon which passes from the lower lid to the margin of the cornea. The upper lid is normal.

P., aged 59. The skin of the lids is red and the margins are thickened. The cilia are defective. There is a band of cicatricial tissue in the lower retrotarsal fold on the left side.

L., 69 years old. The conjunctiva in both eyes show a milk-like opacity. The semilunar fold is not distinct. There is a well-defined band of cicatricial tissue extending

from the upper lacrimal point to the eyeball and there are a number of smaller adhesions. No signs of trachoma. Right, diffuse corneal opacities; left, a marginal adherent leucoma.

K., 81, complains that his eyes burn and tear. On the right side there is slight ectropion. The conjunctiva in the lower lid in its nasal half is atrophic, of pale white color. The caruncle is white; blood-vessels pass from this to the corneal limbus, just as in pterygium. The fold is tense. A symblepharon extends from the lower lacrimal point to the opposing surface of the eyeball. The conjunctiva of the eyeball is wrinkled. Cornea, no change.

S., 58 years old, has suffered from recurring inflammation of the eyes. The lids are red, the semilunar fold is atrophic and thin. The conjunctivæ are atrophic, contracted in folds, and there are two distinct symblepharon-like folds which extend from the lids in the neighborhood of the caruncle to near the margin of the cornea. Left, there is a similar symblepharon, and the conjunctiva has the characteristic whitish appearance.

Z., 73 years old, has suffered from inflamed eyes for twenty years. The right lower lid is inverted, the semilunar fold has lost its definite outline, and the caruncle is somewhat atrophied. Left, ectropion. The lower retrotarsal fold is distinctly shallow. There is a symblepharon at the junction of the inner and middle third. The semilunar fold and the caruncle are not well marked.

D., 68 years old, has frequently suffered from inflamed eyes. The margins of the lids are thickened and red. There are numerous bands of cicatricial contraction which pass from the lid to the eyeball. The caruncle and the fold are atrophic. Old opacities of the cornea.

N., 71 years old, shows a bilateral ectropion, an atrophic conjunctiva, and numerous symblephara and marginal ulcers of the cornea.

DYSPITUITARISM WITH LIMITATION OF THE VISUAL FIELDS; SYMPTOMS DISAPPEARING UNDER THE USE OF INTERNAL GLANDULAR THERAPY, WITH A RETURN OF THE VISUAL FIELDS TO NORMAL.

By Dr. WALTER TIMME, Asst. Phys., Neurological Institute, New York.

(*With a visual field chart in the text.*)

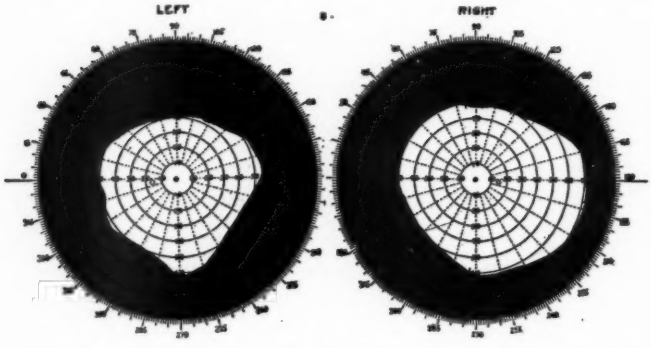
The patient, Miss L. D., was referred to Dr. Timme by Dr. Oestmann of West Hoboken, New Jersey, suffering with headache, feeling of weight in the head, dizziness, drowsiness causing her to fall asleep at odd times, and dyspnœa on exertion. Her past history included the various children's diseases, many attacks of urticaria, free perspiration, and three years previously she had been overcome by the heat. She is 23 years of age.

Present History.—Patient perspires readily, has cold extremities; her headaches began to come on six years ago, shortly after the death of a favorite brother. These headaches, as indeed all her symptoms, are worse just before menstruation and better after it. The "weight" in her head is continuous and is made worse when she uses her eyes. Her headache is referred to the part of her head "back of her nose, deep in the skull." This, together with her drowsiness, had become steadily worse until she could no longer stand it and sought medical advice. She stated that whenever she blew her nose, a mass deep in her head behind her nose moved to and fro. In connection with the increase in her headaches, she began to feel a growing inability to use her eyes for more than a short while without blurring taking place. She was also conscious of some diminution in her vision laterally, more marked on the left side.

Examination.—The patient's status and gait were normal. Her knee-jerks were equal though exaggerated. All other reflexes were normal in their response. Her pupils were

slightly unequal, the right being the larger. She had a moderately enlarged thyroid gland and a slight tremor in both hands. Blood pressure was 125*mm*. There was a slight systolic murmur at the base of the heart. There was an abnormal growth of hair on the body, that over the pubes being masculine in type and distribution. Her legs were very hairy, and there was some hair on her face and on her breasts. The teeth of the upper jaw are broad and spaced. The urine was negative: Wassermann, negative. An X-ray examination showed a moderately deepened sella turcica.

The ocular movements were normal and there was no nystagmus. The pupils responded normally to light and accommodation. The distance between the eyes was greater than normal. The fundi were normal, though the temporal halves of the disks were slightly pale. Acuteness of vision



was $\frac{20}{20}$ each. Her visual fields were contracted temporally on either side, more markedly on the left. On this side the visual field subtended an angle of 50° only. The limit on the right side was 70°. There was no interlacing of the color fields. The patient was referred to Dr. E. Krug, who confirmed the findings.

Diagnosis.—A diagnosis of pituitary enlargement with dyspituitarism was made.

Treatment.—As the patient complained of increase in her symptoms at the onset and during menstruation, corpus luteum was first administered as a test. This regularly produced an exacerbation of her symptoms. She was then placed on small doses of thyroid gland and whole gland pituitary, with some improvement for a few weeks. She then retrogressed. Finally, with gr. ½ thyroid (B. W. & Co.) on alternate days with pituitary gr. i (whole gland, B.

W. & Co.) once a day her headaches were relieved, and the visual fields began to enlarge. The sleepiness, weakness, and fatigability continued in some degree, however. To overcome these symptoms, adrenalin by mouth in 5 to 7 drop doses was given, and later suprarenal gland (whole gland, B. W. & Co.) gr. 2½, twice a day. Thereafter, she was comfortable for the first time in 4 or 5 years. This was four months after beginning the treatment. The visual fields had entirely returned and remain normal to this day, almost two years from the beginning of the treatment. Occasionally it is necessary to combat drowsiness and headaches (both in very mild form) with small doses of pituitary and suprarenal glands. The patient realizes the great change in her condition and is grateful for it.

MYOPIA CASES COMING TO THE MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY FOR THE FIRST TIME BETWEEN JANUARY 1, 1915, AND JANUARY 1, 1916.[1]

By HARRIET GAGE, Milwaukee Children's Hospital.

(With three charts and four tables in text.)

AS the title indicates, this study of myopia is based upon the records of patients coming to the Massachusetts Charitable Eye and Ear Infirmary for the first time between January 1, 1915, and January 1, 1916. Throughout the study myopic astigmatism is considered as an accompanying condition. Cases of compound myopic astigmatism are therefore included in all the tables. Simple myopic astigmatism is included throughout in those cases in which it occurs only in one eye, the other eye showing simple myopia or compound myopic astigmatism.

The degree of myopia as indicated by subjective and objective tests is used here—not the final prescription.

CLASSIFICATION OF MATERIAL.

In the tables based upon the degree of myopia, the grouping of Hirschberg (1) is used: *i. e.*, low myopia to 3 D., medium myopia 3 D. to 6 D., high myopia 6 D. to 15 D., very high

[1] This study, made under the direction of the Boston School for Social Workers, is printed by permission of the school. The manuscript has been abridged by Henry Copley Greene, Field Agent for the Massachusetts Commission for the Blind. The work was planned with the help of George S. Derby, M.D., Boston, of the Eye and Ear Infirmary Staff, and was carried out with some assistance from the Massachusetts Commission for the Blind.

myopia 15 D. and over. Cases of simple myopia are, of course, classified under degree of sphere. Cases of compound myopic astigmatism are classified under degree of sphere plus one half the cylinder.

As occupation is recorded in the Infirmary at present, no distinction is made between industry and process, and there is no statement as to the length of time the patient has spent in the occupation given. The figures under this heading, for all above school age, are, therefore, of little significance in a subject so intimately connected with occupation as is myopia.

The age groups used in Section II, Table I, correspond to five periods of life: the pre-scholastic period, the period of compulsory education, the period of vocational training in school or in apprenticeship, the period of remunerative labor, and the after-work period. This section of the table is mainly valuable in showing the relative size of the groups: 46% of the patients are under 21 years—a figure which shows the field for preventive and educational work open to the Infirmary. The most noticeable figure is that representing 2 cases of high myopia in children under 6 (in both cases 5 years of age). Conclusions cannot be drawn from so small a number; yet the presence of 2 cases of high myopia in children who have never done near work indicates that factors other than concentration in the use of the eyes enter into the causation of high degrees of myopia.

Table II shows the refraction of 1524 eyes in cases of myopia and compound myopic astigmatism expressed in diopters. The figures as given are grouped by diopters. Using the total number of eyes as a basis, the percentage of cases in each degree are graphically shown in the Chart A.

The greater part of the work of the clinic lies in the refraction of comparatively small errors: 43% of the refractions are below 2 D.; 56% are cases of low myopia (below 3 D.); 20% more are cases of medium myopia, making 76% of the cases below 6 D.; 20% are cases of high myopia. Only 2½% show very high myopia. These figures indicate the great opportunity that the Infirmary has to do preventive work. This work involves not only giving a prescription, but also insuring periodic return for observation, giving instructions concerning the proper care of the eyes, and making plain the

TABLE I

816 PATIENTS WITH MYOPIA AND COMPOUND MYOPIC ASTIGMATISM CLASSIFIED ACCORDING TO DEGREE OF MYOPIA AND SEX, AGE, AND OCCUPATION

Better Eye		Emmetropic						to 3 D.						3 D. to 6 D.					6 D. to 15 D.				15 D. & over			Total number patients
Worse Eye		To 3 D.	3 D. to 6 D.	6 D. to 15 D.	15 D. & over	Amblyopic	Blind	To 3 D.	3 D. to 6 D.	6 D. to 15 D.	15 D. & over	Amblyopic	Blind	3 D. to 6 D.	6 D. to 15 D	15 D. & over	Amblyopic	Blind	6 D. to 15 D.	15 D. & over	Amblyopic	Blind	15 D. & over	Amblyopic	Blind	
I Sex	Male	8	1					219	28	5		6	15	51		13		6	49	2		8	5		2	418
	Female	1	1					178	27	7		5	11	47		20		10	52	7		17	11		4	398
II Age groups	To 6 years																		2							2
	6 to 15	3	1					142	14	5			2	31		5		4	13	1		1	1			223
	15 to 21	1						92	15	1		1	2	22		8		1	11	2		3	1		1	161
	21 to 60	5	1					150	24	6		6	11	39		19		7	67	4		12	12		4	367
	60 and over							13	2	1		4	11	6		1		4	8	2		9	2		1	63

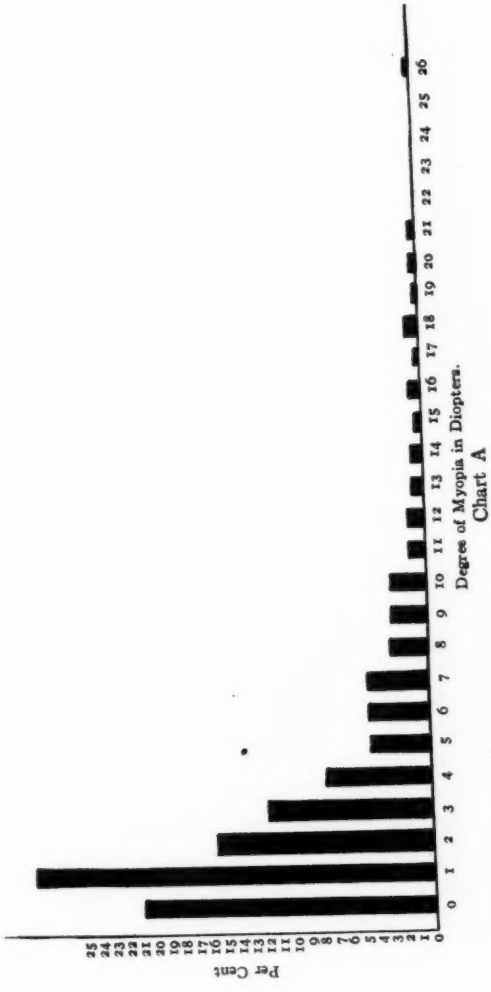

Per Cent.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Degree of Myopia in Diopters.

Chart A

importance of good general hygiene. Such a program calls for both medical and social work.

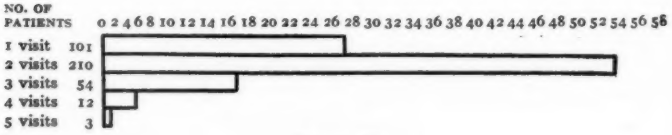


CHART B

At present a considerable number of myopia cases pay only one visit. Of the 101 one-visit cases, Chart B, 71 can be satisfactorily explained from the records without supplementary

TABLE II

REFRACTION OF 1524 EYES IN CASES OF MYOPIA AND COMPOUND MYOPIC ASTIGMATISM EXPRESSED IN DIOPTERS

Degree of Myopia in Diopters	Simple Myopia	Compound Myopic Astigmatism	Myopia and Compound Myopic Astigmatism	% of all M. & C. M. A.
	Eyes	Eyes	Eyes	
.12– .75	170	103	273	18.
1.– 1.75	250	126	376	25.
2.– 2.75	110	98	208	13.5
3.– 3.75	92	65	157	10.2
4.– 4.75	54	47	101	6.6
5.– 5.75	34	28	62	4.
6.– 6.75	36	25	61	4.
7.– 7.75	33	27	60	4.
8.– 8.75	17	23	40	2.6
9.– 9.75	27	12	39	2.5
10.–10.75	21	16	37	2.4
11.–11.75	10	9	19	1.2
12.–12.75	10	10	20	1.3
13.–13.75	8	7	15	1.
14.–14.75	13	2	15	1.
15.00	3	1	4	0.2
16.00	14	1	15	1.
17.00	2	2	4	0.2
18.00	7	2	9	0.5
19.00		1	1	0.1
20.00	3		3	0.2
21.00		3	3	0.2
26.00	2		2	0.1
Totals	916	608	1524	100.

knowledge concerning possible personal reasons for non-return. Sixty patients are over the "cycloplegic age," 44 of them over 45 years, and the remainder between 40 and 46 years. In the latter group a cycloplegic might be used occasionally, in the former rarely if ever. These patients could well be refracted and receive a prescription in one visit. Besides being over the age for the use of a cycloplegic, 13 of these 60 patients came from distances so great as probably to make visits very difficult; 6 others were unhelpable. Of the 41 patients under 40 years of age, 9 lived far enough from Boston to necessitate dilatation in the clinic; 2 more could not be helped. The remaining 30 one-visit cases are not explainable on the face of the records.

Ideally, of course, many patients who require "drops" should return for post-cycloplegic examination and all patients for whom glasses are prescribed should return for the neutralizing of lenses.[1] Ideally, too, every patient with indication of progressive myopia and those in whom myopia is accompanied by degenerative changes should be followed, to insure return for observation, at intervals varying with the seriousness of their conditions. The installation of a follow-up system would do much toward appr oaching this ideal.

We now pass to the question of astigmatism. The extent of the problem of astigmatism in the clinic is shown in Table III, which gives a classification of 1696 eyes in cases of myopia, compound myopic astigmatism, and simple myopic astigmatism, according to the strength of sphere and cylinder: 916 eyes, or 54% of the total, are shown as having no astigmatism; 172 eyes, or 10% of the total, as having simple astigmatism; 608 eyes, or 36%, as having compound myopic astigmatism.

Further analysis gives the following figures for patients with and without astigmatism: 442 patients are shown to have no astigmatism; 449 patients present astigmatic conditions, 129 with one eye and 320 with both eyes astigmatic.

The subject of visual acuity is taken up in this paper for its

[1] This is routine work in probably a very few clinics. The writer knows personally of but one, that at The Johns Hopkins Hospital Eye Clinic; although no doubt there are others. It requires a relatively large staff with a competent attendant optician and a social worker.

TABLE III

1696 EYES IN CASES OF MYOPIA, COMPOUND MYOPIC ASTIGMATISM, AND SIMPLE MYOPIC ASTIGMATISM, CLASSIFIED ACCORDING TO STRENGTH OF SPHERES AND CYLINDERS IN DIOPTERS

	No Sphere.	To 3 D.	3 D. to 6 D.	6 D. to 15 D.	15 D. & over	Total according to strength of cylinder
No cylinder		530	180	175	31	916
To 1 D.	72	226	41	17		356
1 D. to 4 D.	95	138	70	77	7	387
4 D. and over	5	13	7	12		37
Total according to strength of sphere	172	907	298	281	38	

sociological rather than for its medical importance, although medical and social work, in cases of ocular defect, are almost inseparable. As Gould has put it, "Ophthalmology is very frequently another name for Sociology." The following summary gives the situation in brief:

SUMMARY.

Patients with corrected Vision of both eyes $\frac{20}{16}$ or more	362
Patients with corrected Vision of better eye $\frac{20}{16}$ or more	87
Patients with corrected Vision of better eye $\frac{20}{20}$	96
Patients with corrected Vision of better eye $\frac{20}{30}$	74
Patients with corrected Vision of better eye $\frac{20}{40}$	55
Patients with corrected Vision of better eye $\frac{20}{70}$ to $\frac{20}{400}$	79
Patients with corrected Vision of better eye $\frac{20}{400}$	37
Patients with corrected Vision of both eyes less than $\frac{20}{200}$	22
Total having diminution of visual acuity in one or both eyes	450

Table IV shows the age and sex of all patients having vision with correcting lenses of $\frac{20}{70}$ or less in one or both eyes. The age

TABLE IV

257 PATIENTS WITH MYOPIA, COMPOUND MYOPIC ASTIGMATISM, AND SIMPLE MYOPIC ASTIGMATISM, HAVING VISION WITH CORRECTING LENSES OF 20/70 OR LESS IN ONE OR BOTH EYES, CLASSIFIED ACCORDING TO VISUAL ACUITY AND AGE

	Better Eye	Better than 20/70			20/70 to 20/200			20/200		Less than 20/200			
	Worse Eye	20/70 to 20/200	20/200	Less than 20/200	20/70 to 20/200	20/200	Less than 20/200	20/200	Less than 20/200	Less than 20/200	Number of Patients	Number of Males	Number of Females
Age Groups	To 6												
	6 to 15	7	6	6	5	2		1		1	28	10	18
	15 to 21	13	3	6	5		6	1	1	2	37	10	27
	21 to 31	12	6	7	2	5	2	4			38	15	23
	31 to 41	5	1	3	8	2	3	3	1	4	30	17	13
	41 to 60	11	10	11	9	10	3	8	5	9	76	35	41
	60 & Over	4		8	8	2	7	5	8	6	48	24	24
	Totals	52	26	41	37	21	21	22	15	22	257	111	146

groups used in Table IV indicate two phases of the problem: one, prevention of increase of myopia; the other, education and occupational guidance, which increases in difficulty with increasing age. The vision groups are those used by the Massachusetts Commission for the Blind. "$\frac{20}{70}$ to $\frac{20}{200}$" indicates handicap so far as "fine work" is concerned; $\frac{20}{200}$ indicates the border-line cases. "Less than $\frac{20}{200}$" indicates practical or total blindness.[1]

[1] This statement is true in general, and the use of the term in this meaning is sufficiently accurate for the purposes of this table. It must be remembered, however, that equal degrees of defect do not necessarily indicate

From Table IV it is seen that 257 or 31% of the cases are "handicapped" in at least one eye (138 in both eyes); 111 of these patients are male, 67 of them between the ages of 21 and 60, who under normal conditions would be wage-earners, many of them with dependent families; 77 of the patients are women of the same age group. How far diminution of visual acuity is an economic handicap among this group cannot be said; but it is a safe estimate that at least 25%[1] of them would be employed outside the home if not handicapped.

The problem of education which is presented here is grave. Twenty-eight children of school age are among those sorely handicapped. Thirty-eight patients are from 15 to 21 years of age,—a period when they would normally be fitting themselves for self-support.

As would be expected, the number of cases of very low visual acuity and blindness increase with increasing age. Too much stress cannot be laid upon the cases of higher, though in many instances surely diminishing, visual acuity who need guidance and directive education, especially among the younger groups.

Any study of myopia as a problem of the clinic would be incomplete without a special consideration of the school group. The relation of school life to eye defects is a question which has excited great interest in the medical and educational world for many years, particularly since 1865 when Cohn (2) made his extensive study of 1004 myopic children. He found that the number of shortsighted pupils increased from class to class. This condition is also shown by Tenner (3) in a recent study of 1008 myopic cases among school children in New York.

Chart C presents a similar rise in 223 children from 2.7% of the total number at 6 years to 19.2% at 14 years. Such figures would, of course, be far from conclusive evidence in any discussion of the etiology of myopia. However, they

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equal degrees of handicap since the ability to use a remnant of vision differs in individuals.

[1] This estimate is based upon the figure given in the 1910 Census for women over 20 employed in gainful occupations. The census figure is 23% which, considering the greater range in years and the fact that the census figures include all economic classes of the population, is undoubtedly too low for this study. The percentage given here (25%) may, therefore, be considered very conservative.

strongly suggest concentration in the use of the eyes as an important factor in the development of shortsight. One must take into consideration the fact that up to perhaps the eighth or ninth year, school work does not require the same amount of concentration in the use of the eyes that it requires in the later

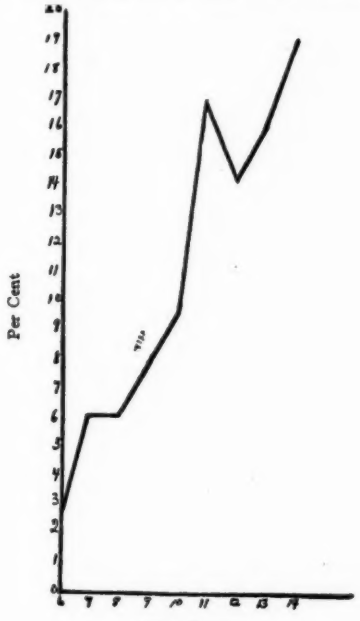

CHART C

years. Visual defects are therefore not apt to receive notice from teacher or parent in the younger children. From the tenth year on, however, the rise is unmistakable; its significance is not lessened by the drop at 12 years.

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2. COHN, HERMANN. *Hygiene of the Eyes*, the section on "The Occurrence of Myopia among School Children." English Translation by Ayers, S. C., and Bishop, J. P.
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REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By LEWIS W. CRIGLER, M.D., Secretary.

GEORGE H. BELL, M.D., CHAIRMAN. MONDAY EVENING, NOVEMBER 20, 1916.

Dr. Martin Cohen reported a case of **unilateral metastatic panophthalmitis, associated with puerperal sepsis.** Mrs. M. G., multipara, in the fifth month of pregnancy, had an induced miscarriage of twins. Five days before admission to the hospital she developed fever, and pain in breasts, abdomen, and left eye. On admission she was examined by Dr. Brodhead who pronounced the condition one of septic endometritis. General physical examination showed the patient to be extremely weak and anæmic. Her blood pressure was low. Examination of blood showed: hæmoglobin, 59%; red blood cell count, 4,272,000; white blood cells, 33,000; polymorphonuclears 79%; large lymphocytes, 15%; small, 15%; eosinophiles, 1%; trans., 4%. Three successive blood cultures taken several days apart revealed the streptococcus hæmoliticus.

Examination of the left eye at the time of admission revealed a well developed panophthalmitis. Evisceration was advised and the patient gave her consent; it was thought, however, best to wait for some general improvement, as her condition was quite grave. The eyeball was eviscerated on July 6th, several weeks after the onset of illness. Before opening the eyeball some of its contents was aspirated under aseptic precautions. Smears and cultures made from this fluid revealed organisms identical with those obtained from the patient's blood, previously. The patient's convalescence was tardy. She left the hospital without consent of her physician,

returning later with a pelvic abscess, the pus from which showed streptococci.

The retina and choroid removed in pieces at the time of operation showed, under the microscope, areas of necrosis, pus cells, increased vascularity, obliteration of the normal structure, and an absence of pigment and organisms. Before the patient left the hospital on September 21st she had had multiple abscesses which healed under drainage and aseptic dressings.

Dr. Cohen said that contrary to the majority of cases of panophthalmitis due to streptococcic infection, the present case points to the non-specificity of the localization of the infection, as evidenced by the multiple abscesses and the unilaterality of the panophthalmitis.

DISCUSSION: Dr. CLAIBORNE said that during the past twenty years he had seen three cases: one due to puerperal septicæmia, one due to pneumonia, and one following scarlet fever. All the cases however were diagnosed clinically.

Dr. CLAIBORNE presented a case of **buphthalmos in a child 12 years of age.** On June 25, 1916, he trephined the left eye; following the operation the tension remained reduced, the eyeball became much smaller in size, and since that time there has been a gradual softening and shrinkage of the eye. The left eye is very much enlarged, but the patient still can see large objects indistinctly. The tension is very much increased. Dr. Claiborne said that he was anxious to know what the members of the Section thought should be done to the other eye in view of the bad results on the left. He was inclined not to operate for fear of totally blinding the child.

DISCUSSION: Dr. SCHIRMER advised repeated anterior sclerotomies. Dr. WEEKS said that he too would perform anterior sclerotomy and in the event of inability to control the tension in that way, he would trephine. He said that his results, on the whole, had been satisfactory. He advised removal of the left eye. Dr. WEIDLER also advised removal of the left eye on account of the possibility of sympathetic inflammation in the right.

Dr. J. E. VIRDEN showed a case of **buphthalmos in a child fifteen months of age.** Dr. Virden first saw the child when it was a month old. The eyes were then so large that the lids

could not be closed. When the child was five weeks old he operated on the right eye, trephining the sclera posterior to the ciliary body. A similar operation was performed on the left eye when the child was twelve weeks old. Both eyes have been much reduced in size, the tension is apparently normal, and the child now sees objects. At the time of operation there was no clear cornea; it was impossible to tell where sclera stopped and cornea began. Dr. Virden said that he thought that all trephinings should be made back of the ciliary body for the relief of increased tension in these cases.

DISCUSSION: Dr. SCHIRMER said that the vitreous chamber should never be opened when it could be avoided on account of the danger of infection and degeneration of the vitreous.

Dr. WHEELER said that scleral trephining was the original method of operation in these cases but that it had been abandoned for the reason that it was found that the tension did not remain reduced.

Dr. O. SCHIRMER presented a patient from whose right eye he had **extracted a senile cataract in the presence of an iridocyclitis of the other eye.** An extraction was done on the left eye in April, 1914, with favorable results. In September, 1915, a needling was done followed in three weeks by a severe iridocyclitis. Dr. Schirmer first saw the patient in February, 1916. At that time there was a mass of exudation in the pupillary space, the eye was red, painful, and sensitive to light. Tension -1. Vision $\frac{1}{2}$. In spite of energetic treatment extending over a period of three months, there was no improvement; on the contrary, the eye was softer. The cataract being mature in the right eye, it was determined to extract it before enucleating the inflamed eye for the following reasons: First, Dr. Schirmer had never seen a case of sympathetic ophthalmia develop while the system was saturated with mercury; and second, it was very important that the patient return to his work as soon as possible.

Extraction was done without iridectomy to avoid danger of producing an iritis. Recovery was uneventful. Two weeks following the extraction the inflamed eye was removed. The right eye now has normal vision with a correcting lens. Dr. Schirmer thinks this one of the rare exceptions, where one is

justified in operating on a healthy eye, in the presence of an iridocyclitis in the other.

Dr. SHANNON presented a case of **Mooren's ulcer, four months after the eye was pronounced well.** Dr. Shannon had previously shown the case to the Section when the margin of the ulcer was advancing but its activity had been checked somewhat by several cauterizations. It was not until the fifth cauterization—one with pure carbolic acid; one with formalin, 20%; and three applications of the actual cautery (the last application being particularly thorough)—that the inflammation began to disappear. The eye is now entirely free from inflammation; the area invaded by the ulcer is becoming more transparent and vision is steadily improving. The advancing margin of the ulcer did not reach beyond the center of the pupillary area. The patient's vision is now $\frac{20}{40}$.

DISCUSSION: Dr. CLAIBORNE said that he was not surprised at the result obtained. During his association with Dr. Gruening he had seen quite a number of cases and he did not recall that they had had any great difficulty in curing them with the actual cautery.

Dr. SCHIRMER doubts the correctness of the diagnosis in this case as it has been his experience that all eyes attacked with Mooren's ulcer were eventually lost. He said that the disease was extremely rare; he had seen four cases in 120,000 eye cases.

Dr. JEAN said that he had had the pleasure of seeing Dr. Shannon's case before recovery. He considered it a typical rodent ulcer and said that Dr. Shannon was to be congratulated on the result. Dr. Jean said that he saw a case in Uhthoff's clinic two years ago that had resisted all treatment for ten years. He said that the actual cautery had not done well in Dr. Uhthoff's hands and that he was then using weak solutions of silver nitrate instead. He had seen a section of a cornea showing the superficial scar tissue with the infiltrated undermined edge. He said that the disease was not uncommon in Japan.

Dr. WEEKS presented an unusual case of **epithelial proliferation of the cornea.** It partook of the nature of a new growth. It was elevated, circumscribed, elliptical in shape, about 4*mm* in its shortest and 8*mm* in its longest diameter; the outer edge was internal to the limbus. In spite of being twice removed

and the base curetted, the mass recurred without producing any inflammatory reaction. The growth was of a pearly translucence. There was never any injection of the ocular conjunctiva. No bacteria were found in the scrapings, which consisted of epithelial cells only. It could not be determined whether or not the growth went beneath Bowman's membrane. Dr. Weeks thinks that it might be a beginning epithelioma, or perhaps be analogous to the epithelial plaques sometimes seen on the conjunctiva near to, and concentric with, the margin of the cornea. The growth is of six months' duration.

DISCUSSION: Dr. SCHIRMER said that he had never seen anything like it. It suggested to him a fibroma, but in view of the microscopic findings and the translucent appearance, he was at a loss to classify it.

Dr. COHEN asked if it might not be a congenital epithelial cyst. Dr. Weeks replied that he did not think so, as such growths do not tend to recur, when once removed.

Dr. J. WOLFF presented a case of **aortic regurgitation with pulsation of all the small arteries.** Dr. Wolff showed the case, not that it was of any particular interest, but that members of the Section who had not had the opportunity of seeing the condition before, so beautifully shown in the retinal arteries, might do so.

DISCUSSION: Dr. WEEKS said that he had a patient in his early years of practice, who said that his vision always became diminished on exertion. After that he made it a practice to examine all of his heart cases for that symptom and found it quite common. He considered it due to a temporary increase of intraocular tension.

MONDAY EVENING, DECEMBER 18, 1916. GEORGE H. BELL, M.D., CHAIRMAN.

Dr. J. H. CLAIBORNE showed a case of **foreign body (probably lead) encysted in vitreous.** Patient was struck in right eye by piece of metal as a rebound from a Remington bullet against a piece of steel about twelve feet away. Dr. Claiborne saw the patient two days after the accident occurred. There was a ragged wound of the cornea; the iris was torn and prolapsed into the corneal wound. The lens was cataractous. As the bullet was known to contain a small quantity of steel it was thought best to try to remove the foreign body by means

of the giant magnet. This was done, but failed to have any effect. The prolapsed iris was removed and the wound treated antiseptically. Recovery was uneventful and at the end of six weeks the lens was completely absorbed. Vision with correction is now $\frac{20}{30}$. The foreign body, shown by means of X-ray, is just in front of the optic-nerve head. It is apparently encysted.

DISCUSSION: Dr. SCHIRMER asked if the patient's field of vision was normal. He said that foreign bodies composed of iron produced concentric contraction of the field with loss of vision.

Dr. OTTO SCHIRMER showed a case of **associated movements of the eyelids.** The patient, a perfectly healthy man 28 years of age, developed a left-sided facial paralysis seven months ago. After four months, a slow but continuous improvement began. To-day, recovery is perfect, except for a slight weakness of all the muscles innervated by the seventh nerve. For more than three months he has noticed that every movement of his left cheek (in laughing and chewing) is accompanied by a partial closure of his left eyelids. Spontaneous contractions of his left orbicularis are not present.

Dr. Schirmer thinks that these associated movements are due to the fact that, from the central stump of the facial nerve, nerve fibers which were meant for the muscles of the cheek have grown into the orbicularis muscle. They connect the ganglion cells for the cheek muscles with the orbicularis; every intended movement of the cheek therefore will be accompanied by a contraction of the lid muscle. This explanation was first given by Lipschitz.

DISCUSSION: Dr. MARTIN COHEN said that he had seen a case similar to Dr. Schirmer's. He said that a diagnosis of infantile paralysis was first made but that later it was thought that the paralysis was peripheral.

Dr. M. L. FOSTER said that he did not think it possible to make a positive diagnosis in the presence of the symptoms and physical signs given.

Dr. W. B. WEIDLER showed a case of **pemphigus of the conjunctiva.** Mrs. A. K., age 71, has had some redness of the right eye since last September. For the past year she has complained of difficulty in swallowing. There has been some difficulty in breathing owing to the formation of large scabs

in the anterior part of both nostrils. At present, the right eye shows considerable injection of the bulbar conjunctiva in the lower half, and tarsal conjunctiva of the lower lid. Cicatricial bands are slowly forming and decreasing the depth of the lower cul-de-sac. The conjunctiva is encroaching upon the cornea below and to the inner side. No blebs or ulcerations have been seen. The condition has progressed in spite of all treatment.

DISCUSSION: Dr. MAY advised the use of radium.

Dr. DWYER said that he had seen one case that showed body complications. One eye had been completely lost and the other is growing progressively worse.

Dr. MARTIN COHEN said that he had recently showed a case before the Dermatological Section. They said that in view of the pathology described, the term "pemphigus" should not be applied to this disease.

Dr. COHEN said that he had tried radium in his case but without relief.

Dr. W. B. WEIDLER showed a case of **tumor of the hypophysis.** Mrs. L. W., age 45, complains of failing vision for some time, of headaches, and occasional diplopia. Her general condition is good and family history negative. About a year ago, there was complete bitemporal hemianopsia; vision in the right eye was $\frac{20}{50}$, and in the left, $\frac{20}{200}$. There has been a gradual diminution of the vision and field in the right eye, and but slight change in the left.

X-ray shows marked enlargement of the sella with almost complete obliteration of the posterior clinoid processes.

Sellar decompression under general anæsthesia and, subsequently, repeated openings under local anæsthesia have been done in attempting to relieve the increased intracranial pressure, but only with temporary relief.

DISCUSSION: Dr. MAY said that he had seen a similar case. After consultation with Dr. Elsberg, the patient declined operation. He then decided to use pituitrin. The patient's vision improved from $\frac{20}{50}$ to $\frac{20}{30}$; there was also an improvement in the fields. The patient was given eighteen injections of 1*cc* each.

Dr. GEORGE H. BELL said that Darièr of Paris had recently reported good results in these cases from the use of the X-ray.

He suggested that, before advising operation, it might be well to try it.

Dr. C. H. MAY showed a case of **streptothrix** involving the conjunctiva of the left eye. The patient's symptoms began in October, 1915. Since that time the conjunctiva of the left eye has been inflamed, and the eye has been very sensitive to light. The patient has been to several physicians of prominence without obtaining relief. When first seen by Dr. May, the conjunctiva of the lower lid was markedly reddened and swollen, granular in appearance, and covered, over a portion of its extent, by a thin yellowish white membrane which was firmly adherent to the underlying parts. The bulbar conjunctiva of the lower portion of the eyeball was reddened and somewhat thickened, and presented a superficial ulcer about one quarter of an inch in diameter, covered with a thin membrane like that seen on the palpebral conjunctiva.

A culture was made from an excised piece of the affected conjunctiva which revealed the presence of the streptothrix. Smears and cultures from the conjunctival secretions showed nothing. The patient has been given iodide of sodium, salvarsan, and the affected area treated with tincture of iodine with very slight relief.

DISCUSSION: Dr. SCHIRMER said that he had seen streptothrix involving the canaliculus in which there was an associated conjunctivitis but that involvement of the conjunctiva alone was extremely rare. When the canaliculus alone is involved, recovery is usually rapid after a slit is made in the punctum and the concretion removed. Dr. Schirmer thinks that this must be a different type from that ordinarily met with, in as much as it is so difficult to cure.

Dr. GEHRUNG said that he had frequently seen streptothrix involving the throat and that he had found the local application of lactic acid very efficacious; he advised that it be tried in the treatment of this case.

Dr. J. A. GEHRUNG showed a case of **congenital buphthalmos** in each eye, in a child four years of age. She was brought to the clinic for the relief of a traumatism in which the anterior chamber of the left eye was completely filled with blood. The cornea of both eyes extended almost the full width of the palpebral fissure; they were evenly round and bulging. There

was a macula in the center of the right cornea. The iris was atrophic, so that in several places the pigment layer could be distinctly seen.

After the absorption of the hyphema in the left eye, the cornea was seen to be free from opacities. The sclera was of a bluish color. The iris showed a coloboma, due either to a congenital defect or laceration from traumatism. There were also several small holes in the iris in the region of the coloboma through which the margin of the lens could be seen.

The disks in both eyes were normal. Tension was not increased and there was no pathological disturbance in either fundus.

An optical iridectomy was performed on the right eye. Vision in each eye after all treatment was discontinued was: Fingers at three feet.

Dr. Gehrung said that it was of interest to know whether or not the coloboma in the left eye was congenital or traumatic; in either case would it act in controlling the tension as an iridectomy surgically performed? He thought it strange that a blow severe enough to cause a rupture of the iris, did not produce more damage to the other parts of the eye.

DISCUSSION: Dr. GRAEF said that he thought the condition was due to traumatism, and that the lens was cataractous.

Dr. SCHIRMER likewise thought the rupture traumatic, that the lens was not dislocated, but that its edge could be more easily seen on account of the enlargement of the eyeball, the lens not sharing in the enlargement.

Dr. JEAN said that the disks are not usually cupped in these cases for the reason that the sclera yields instead.

Dr. BEN WITT KEY read a description of his **modification of Barraquer's operation of fat implantation.** He has performed the operation fifteen times with very gratifying results in all but one, a syphilitic in which there was some sloughing and absorption of fat. He showed two of the cases upon whom he had operated three and a half years ago and another case operated upon two weeks ago.

A brief description of the operation is as follows:

1. The conjunctiva is dissected back from about the cornea in the usual manner, except that it is dissected well back over the attachment of the four recti muscles.

2. Each of the four recti muscles is attached to the conjunctiva and subconjunctival tissues in the following manner:

The muscle is caught in full by a strabismus hook and a muscle forceps is inserted beneath it. The adjacent conjunctiva is pulled forward well over the muscle attachment when the forceps is clasped firmly upon the muscle including conjunctiva. The muscle is now cut free from the globe, and a chromicised catgut suture, size 000 or regular 00 catgut, is placed through the conjunctiva and muscle from without inward and then from within outward. This suture includes within its loop the middle fourth of the muscle fibers well back of the position of the forceps. Of considerable importance is the placing of these sutures far outward from the cut margin of the conjunctiva and well through the subconjunctival tissues of that part. The muscle being thus attached, is released from the forceps and is seen to pull backward upon the area of transitional fold.

When each of the four recti muscles has been cut and attached in this manner, a purse-string suture of chromicised catgut, size 0, is placed in the free cut margin of the conjunctiva in the usual manner. The eyeball is then enucleated in the usual manner. The socket is backed with gauze moistened with normal salt solution, without being first irrigated. A sufficient quantity of fat is removed from the anterior part of the thigh sufficiently to fill the cavity without undue pressure. The purse-string suture is drawn tight and tied. Three mattress sutures of twisted silk, size 5, are placed across the pouch made by the purse-string suture.

The dressing and after-care of the wound is treated with due regard to asepsis.

It will thus be seen that the manner of attaching the muscle to the sides of the fatty stump, the mechanical perfection and effect of nature's method is copied as far as possible. Some of the advantages claimed for the operation are: Maximum motility in a soft socket; prominence of shell in conformity with fellow eye; reduces tearing and sustains the moisture of the glass shell so that excretory substances do not accumulate rapidly. The lacrimal secretion is largely restored.

DISCUSSION: Dr. SCHIRMER said that he approved the principle of the operation. He said that he thought the secret

of getting good results in fat transplantation was in not irrigating the cavity to be filled with anything, and the fat used should be conveyed direct to the cavity without using any sort of solution. He uses nothing but dry gauze to remove blood-clots.

Dr. WEIDLER said that he had done the usual fat transplantation seven times with absorption of the fat in two-thirds of the cases.

Dr. MAY said that his results following the old method had been good. He said that he had recently seen Dr. Wolff remove a piece of skin with the underlying fat, transplanting the whole and attaching the four recti muscles to corresponding parts of the skin margin.

Dr. COHEN said that it was he who suggested to Dr. Wolff the above procedure. Dr. Cohen said that he thought that he was the first to suggest this operation, but that on looking up the literature on the subject, he found that Rollet had preceded him.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

By H. KOELLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMELL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of Drs. ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mayence; CURRAN, Kansas City; DANIS, Brussels; GILBERT, Munich; GROENHOLM, Helsingfors; v. POPPEN, Petrograd; TREUTLER, Dresden; and VISSER, Amsterdam.

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FIRST AND SECOND QUARTERS, 1916.

X.—ORBITS AND EXOPHTHALMOS.

67. BRAZEAU, S. D. **Pulsating exophthalmos treated by slow occlusion of the common carotid with Neff clamp.** *Ophthalmology*, April, 1916.

68. DUTOICT, A. **A case of orbital cellulitis cured by paraspecific treatment.** *La clinique ophtalmologique*, vii., 1.

69. LEENHEER, C. A. **An orbital endothelioma.** *Ophthalmic Record*, May, 1916.

70. MILLER, F. W. **Retained foreign bodies in the orbit.** *Ophthalmology*, April, 1916.

71. TERRIEN and LEDOUX-LEBARD. **Extraction of foreign bodies from the orbit with the aid and control of the fluoroscopic screen.** *Archives d'ophtalmologie*, xxxv., 1.

72. VERHOEFF, F. H. **A simple operation for contracted socket.** *Ophthalmic Record*, March, 1916.

73. ZENTMAYER, W. **Traumatic pulsating exophthalmos.** *Journal of the American Medical Association*, July 15, 1916.

VERHOEFF (72, **Operation for contracted socket**) dissects out all the scar tissue from the orbit and also some of the orbital fat if necessary to make the cavity of sufficient size. He then inserts a 18.5*mm* glass ball which has been completely

covered with two thicknesses of Cargile membrane and large Thiersch grafts. The eye is kept bandaged for four days when the Cargile membrane is removed and the ball replaced. After two to three weeks of daily dressings, the ball is replaced by a reform eye. Canthoplasty is sometimes necessary with a short fissure. ALLING.

LEENHEER (69, **Orbital endothelioma**) reports an orbital endothelioma which had existed for about twenty years. The Kronlein operation was done about ten years ago but the tumor recurred to about its original size and an exenteration was performed last October.

ALLING.

DUTOICT (68, **A case of orbital cellulitis cured by paraspecific treatment**) says that a certain Swiss proprietary drug, called "Novitas" or "Tapo," when administered, even by mouth, has the property of producing a general leucocytosis and of enhancing the opsonic index of the blood. He has seen an orbital cellulitis in a twelve-year-old patient clearing up in two days after the administration of "Novitas" *per os*, a tablespoonful every hour.

SCHOENBERG.

MILLER'S (70, **Retained foreign bodies in the orbit**) cases are as follows: (1) Boy who fell upon a sharp stick of wood which penetrated the orbit below the eye and broke off. Piece 1½ in. long was removed. Ten months later, there having been no symptoms in the interval, a foreign body could be felt and another similar splinter was extracted. (2) Patient was hit by a large piece of steel above the eye. After six months the eye became painful and a fragment of steel *5mm* by *3mm* by *2mm* was removed from the roof of the orbit where it had penetrated the frontal lobe. There had been no orbital or intracranial symptoms. (3) Injury by piece of steel. No symptoms, but X-ray showed foreign body in the orbit which was removed by magnet through an incision. (4) Many pieces of lead pencil and eraser removed from the orbit through the original wound. Prompt recovery. (5) and (6) Two cases of shot in the orbit remaining innocuous. (7) Piece of stone removed from the orbit after having remained five years without producing symptoms.

ALLING.

TERRIEN and LEDOUX-LEBARD (71, **Extraction of foreign bodies from the orbit with the aid and control of the fluoroscopic screen**) say that professional radiologists consider radiographic localization of bullets in the cranium, in the face, and in the orbit as an almost hopeless task. The authors have succeeded in extracting foreign bodies from the orbits of three soldiers and the method employed was responsible for the relative facility of the operation. It should have been best performed in the X-ray department with the X-ray picture as a guide. The incision is made and a sound is introduced in the approximate direction. The fluoroscopic screen is then used to see whether the sound is properly directed and how far the point is from the foreign body. By repeatedly controlling with the screen the situation of the sound, the operator soon reaches the foreign body, when forceps introduced along the sound catches and extracts it.

SCHOENBERG.

BRAZEAU (67, **Pulsating exophthalmos treated by slow occlusion of the common carotid**) successfully employed a new method of compression of the carotid devised by Neff of Spokane. It consists of a clamp of aluminium bands which are applied around the artery after dissection and the pressure is applied gradually.

ALLING.

ZENTMAYER (73, **Traumatic pulsating exophthalmos**) has brought the literature of this subject to date—the last review having been made in 1914. He has added 29 cases. A summary of results of treatment of the latter group is as follows: The common carotid was ligated in 16, resulting in cure of 7, improvement in 5, and failure in 4. Combined ligation of the common carotid and ophthalmic vein was done once and resulted in cure. Combined ligation of the internal carotid and facial vein once, with cure. Ligation of orbital veins, once with slight improvement. Slow ligation of the carotid twice—one cure, one improved. Ligation of both carotids once—failure. Compression of carotid four times—two cures, one improved, one result unknown. Gelatine injections once—cure. No treatment in 6. Including all cases reported to date, 32 ligations of the common carotid have been done without fatality. Cerebral softening, which is to be feared, would seem

to be avoided by slow compression. In view of the fact that death may result from operation on the ophthalmic vein, slow ligation appears to be the best procedure, reserving ligation of the ophthalmic for unsuccessful cases.

ALLING.

XI.—CONJUNCTIVA.

74. KALT, M. **Remarks on the technic of making conjunctival flaps for covering the cornea.** *Annales d'oculistique*, cliii., 1.

75. O'CONNOR, R. **A buried knot conjunctival suture.** *Ophthalmic Record*, March, 1916.

KALT (74, **Remarks on the technic of making conjunctival flaps for covering the cornea**) advises against the tendency of many eye surgeons to cover corneal injuries with conjunctiva drawn from all around the limbus and kept in the center of the cornea by a purse-string suture. While the method is easy of execution it is not effective, because the conjunctiva retracts in a few days and the wound is left exposed. He prefers to draw the upper and lower portions of the bulbar conjunctiva in a horizontal line around the cornea and applies several sutures at 4–5*mm* distance. The points of entrance and exit for the sutures should not be less than 4*mm* from the margin of the wound.

SCHOENBERG.

To avoid irritation from the knot, O'CONNOR (75, **Buried knot conjunctival suture**) enters the needle from the underside of one margin of the wound and, crossing over to opposite side, pierces it from without. When the knot is tied it sinks into the wound.

ALLING.

XII.—CORNEA AND SCLERA.

76. BLUM, H. W. **Keratitis associated with dental caries. Report of cases.** *Ophthalmic Record*, August, 1916.

77. DARIÈR, A. **The treatment of infectious ulcers of the cornea with ethyl hydrocuprein.** *Clinique ophtalmologique*, vii., 1.

78. LANDOLT, M. **Closure of a scleral wound.** *Archives d'ophtalmologie*, xxxv., No. 2.

79. PRINCE, A. E. **Pasteurization in the treatment of corneal ulcers.** *Ophthalmic Record*, April, 1916.

80. SCARLETT, M. **Corneal infections produced by diplobacilli of a type not before described.** *Annales d'oculistique*, cliii., 3.

81. WALKER, S. **Fracture of Descemet's membrane.** *Annals of Ophthalmology*, April, 1916.

SCARLETT (80, **Corneal infections produced by diplobacilli of a type not yet described**) has succeeded in isolating from the corneal ulcers of two patients diplobacilli of a different type from those known up to the present time, those of Morax and Petit, which he calls Bacillus duplex liquefacians and Bacillus duplex Josephi.

SCHOENBERG.

PRINCE (79, **Pasteurization in the treatment of corneal ulcers**) recites a number of cases of ulcer which he successfully treated by applying a heated ball, just far enough away so as not to cauterize. The heat should not register more than 150° and most bacteria are killed below this temperature. The advantage over the cautery is that no tissue is destroyed.

ALLING.

DARIÈR (77, **The treatment of infectious ulcers of the cornea with ethyl hydrocuprein**) has treated, during the past two years, a number of corneal ulcers with optocin (ethyl hydrocuprein) and was impressed with its superior efficacy. The practical demonstration that the effect was the result of the exclusive action of the drug was not attempted, since various other agents (atropin, dionin, mercury oxicyanide, etc.) were used in conjunction with it.

SCHOENBERG.

BLUM (76, **Keratitis associated with dental caries**) relates cases of ulcerative and interstitial keratitis occurring in connection with disease of the teeth. After a review of the literature bearing on the subject he concludes that the corneal changes were neuropathic in origin. The trophic changes he thinks were due to reflex disturbance of the branches of the trigeminus. An herpetic eruption and anæsthesia were associated with the lesions in many of the cases. Improvement was noted after proper attention was given to the teeth.

ALLING.

LANDOLT (78, **Closure of a scleral wound**) describes a simplified procedure for suturing the scleral wound with a conjunctival flap covering it. A suture with two needles is used. The conjunctiva is undermined and one of the needles is introduced through the conjunctiva at a distance of about 8*mm* from the margin of the wound, then through the opposite margin of the scleral wound, through the second margin of the

scleral wound, and finally out through the conjunctiva at a 4*mm* distance from the point of entrance. The other needle is employed the same way, at some distance from the first. When both extremities of the thread are drawn together the scleral margins of the wound are in apposition and the conjunctiva is drawn over it.

SCHOENBERG.

WALKER (81, **Fracture of Descemet's membrane**) relates the case of a man whose eye was injured by hitting a blunt object. A week after the accident the anterior chamber was deep and the cornea hazy. By oblique illumination five nearly vertical, tortuous striæ were found on the posterior surface of the cornea. Later the lines disappeared and he developed uveitis with deposits on Descemet's membrane, vitreous opacities, and detachment of the retina. Rupture of Descemet's membrane may be due to internal pressure as in myopia and buphthalmos as well as to external force.

ALLING.

XIII.—IRIS.

82. ALT, A. **A case of implantation cyst of the iris.** *American Journal of Ophthalmology*, May, 1916.

83. REBER, W. **Concerning the ætiology of iritis as determined by laboratory methods, and its treatment, especially by bacterins.** *Ophthalmic Record*, May, 1916.

84. TOULANT. **A case of metastatic carcinoma of the iris.** *Archives d'ophtalmologie*, XXV., 1.

ALT (82, **Implantation cyst of the iris**) examined a cyst of the iris which resulted from a perforating wound of the cornea. It appeared as a pearly gray tumor apparently springing from the iris and reaching nearly to the pupillary edge. Two eyelashes could be seen attached to the upper end of the corneal scar. Under the microscope the cyst was found to lie wholly within the iris which it divided into two unequal layers, the anterior being the thinner. The cyst undoubtedly originated by implantation of epithelial cells derived from one of the sebaceous glands lying at the root of the lashes.

ALLING.

REBER (83, **Ætiology of iritis, and treatment with bacterins**) has studied 15 cases of acute primary iritis with the following results: 5 were syphilitic, 3 were gonorrheal, 1 gastrointestinal

toxemia, 1 probably tuberculous, 2 doubtful syphilitic, 2 had influenza two or three months before. All cases were thoroughly examined by all laboratory methods. The tests for syphilis and gonorrhea are reliable, but the complement fixation-tests for the pneumococcus, streptococcus, staphylococcus, and influenza are more uncertain. In cases of unknown origin he advocates experimental injections of influenza mixed bacterins. ALLING.

TOULANT (84, **A case of metastatic carcinoma of the iris**) reports the case of a patient, 31 years old, who presented a tumor of the iris in each eye, eleven months after a carcinomatous breast had been amputated. She also had numerous small tumors of the skin and lymphatic glands. The examination of one of the skin tumors confirmed the diagnosis of general carcinomatosis. The evolution of the tumors in the iris was irregularly progressive. Several small tumors appeared in the iris of each eye and the original tumor in the left eye grew in size until it touched the posterior surface of the cornea. All the tests for syphilis and tuberculosis were negative. The tension, normal at the beginning, became low later on. The patient disappeared from observation after one year. The general condition remained the same during this time. This is the second case of metastatic carcinoma of the iris in literature. SCHOENBERG.

XIV.—LENS.

85. GIFFORD, H. **Some impressions of the expression of cataract with a sliding conjunctival flap.** *Annals of Ophthalmology*, January, 1916.

86. JACKSON, EDWARD. **Discission of the crystalline lens.** *Journal of the American Medical Association*, July 29, 1916.

87. MAYNARD, F. P. **New method of dressing eyes after cataract extraction.** *Ophthalmic Review*, June–July, 1916, p. 102.

88. SHAHAN, W. E. **Removal of steel from lens; nonformation of cataract.** *American Journal of Ophthalmology*, May, 1916.

89. SMITH, HENRY. **Conjunctival flaps in cataract operations.** *Ophthalmoscope*, March, 1916.

90. WEIDLER, W. B. **Congenital coloboma of the lens.** *Ophthalmic Record*, July, 1916.

91. WILDER, W. H. **The linear method of cataract extraction. Cases suitable for it, and its advantages.** *Ophthalmic Record*, May, 1916.

In WEIDLER'S (90, **Congenital coloboma of the lens**) case the iris was not fully developed on the nasal side over the

coloboma and the pupillary edge was slightly notched. There was no defect in the choroid. About 5*mm* from the center of the lens on the nasal side toward the coloboma there was a series of concave shadows. The notching appeared to be about 3–4*mm* in depth. The vision was $\frac{20}{70}$. ALLING.

SHAHAN (88, **Removal of steel from lens without formation of cataract**) removed a small piece of steel from the lens through the original wound but more than a year later the lens was clear except for the spot where the foreign body had been and the vision was $\frac{20}{15}$. ALLING.

Discission may be performed safely according to JACKSON (86, **Discission of the crystalline lens**) in many cataracts even up to the age of fifty. The first operation should make only a small opening in the capsule, but may penetrate into the nucleus so that the disintegration may begin as early as possible. Severe reaction and surgical shock are provoked by large masses of lens matter in the anterior chamber. The needle should be introduced through the vascular limbus. Occasionally hemorrhage into the anterior chamber occurs but is of no consequence. ALLING.

WILDER (91, **Linear extraction**) summarizes the advantages of this operation by stating that it is applicable for the extraction of the soft cataract for the person under 35 years of age, being most satisfactory when preceded by discission of the capsule. It is the operation for traumatic cataract for a person not older than 40 years. It is an excellent method of operating upon thick membranous cataracts. The incision, being a comparatively short cut with the lance, heals more quickly because of the perfect coaptation. ALLING.

SMITH (89, **Conjunctival flaps in cataract operations**) discusses the advantages and disadvantages of conjunctival flaps in capsulotomy and intracapsular operations. He considers that conjunctival flaps do not admit of successful intracapsular extractions. Smith sums these objections and the advantages of conjunctival flaps as follows:

1. The time spent on the operation is quadrupled, thus rendering a good patient a very troublesome one before the operation is finished.

2. The amount of astigmatism with conjunctival flaps is often very marked.

3. The traumatism in flap operations is trebled.

4. The difficulty of making the incision the correct size. except in Stanculean's flap.

5. The field of operation is obscured by blood and loose conjunctiva.

6. The increased difficulty in extracting the lens.

7. The increased difficulty in replacing the iris.

8. In intracapsular extraction the practical impossibility of dealing with burst capsules and other complications.

The advantages of conjunctival flaps:

1. This operation claims to be followed by less sepsis, but this by no means has been proved by anything beyond an *ex-cathedra* opinion.

2. It claims that the conjunctival and sclero-corneal wounds heal more rapidly. The conjunctival wound does unite quickly, but in some cases it actually prevents the sclero-corneal wound from uniting.

3. Prevention of iris prolapse. This I absolutely challenge. The cause of prolapse of iris is pressure on the exterior of the eye, and no flap can prevent this. It is better for it to be prolapsed and exposed than to be prolapsed under the conjunctiva, where it is more difficult to deal with.

In intracapsular extraction it has yet to be shown in large figures that less sepsis follows conjunctival flaps than is the case with the ordinary wound entering in the limbus and ending in the cornea.

GIFFORD (85, **Extraction of cataract with a sliding conjunctival flap**) has used the sliding flap advocated by Kuhnt practically as modified by van Lint. The conjunctiva is dissected loose around the upper half of the periphery of the cornea for about one half inch back. A suture is then passed on either side and down, taking hold of the conjunctiva on a level with the lower border of the cornea. After the extraction, which proceeds as usual, the stitches are tightened and the conjunctiva brought down ¼ inch below the upper margin of the cornea. The principal disadvantage is the extra time required. The flap seems to be a safeguard against infection, but the great advantage he claims is in the control of vitreous prolapse. Immediately the prolapse occurs, the suture is tied. The author fails to note, however, that loss of vitreous in a

certain proportion of cases occurs before the delivery of the lens. He has operated upon 130 cases by this method.

ALLING.

MAYNARD (87, **New method of dressing eyes after cataract extraction**) uses wool pads, pulled into pads an inch thick and three inches in diameter. These are sterilized by boiling in a 1:5000 biniodide solution. After the eyes are closed, two of these, sopping wet, are laid upon the two eyes and gently molded over the lids. Over this is placed a wet pad consisting of lint or four layers of gauze, and then a figure-eight bandage applied fairly firmly. This produces no uneven pressure and does not allow the eyes to move easily. The eyelids cannot be opened under them. The best wool free from grease should be used.

CURRAN.

XV.—CHOROID.

92. MAGITOT. **Pigmented nævus of the choroid.** *Annales d'oculistique*, cliii., 3.

MAGITOT (92, **Pigmented nævus of the choroid**) reports a case in which the examination of sections of a normal eye, enucleated in order to create access for an operation of an epithelioma of the ethmoidal sinuses, revealed a pigmented nævus of the choroid. It consisted of large polygonal, epitheloid cells in the center, and of fusiform cells at the periphery where there was a number of blood-vessels. The cells were deeply pigmented, had all the appearances of adult cells and nothing to suggest malignancy. The sclera and choriocapillaris were normal. The cells had the characteristic points of chromatophores of fusiform shape, and the general impression is that we have to deal with a connective tissue, not with an epithelioma.

SCHOENBERG.

XVI.—GLAUCOMA.

93. ABADIE, CH. **Remarks on secondary glaucoma.** *Clinique ophtalmologique*, vii., 2.

94. MORAX, V. **Glaucoma simplex or optic atrophy with excavation.** *Annales d'oculistique*, cliii., 1.

95. MORAX, V. **Ophthalmic zona complicated by glaucoma.** *Ibid.*, cliii., 2.

96. PRINCE, A. E. **Report of a gold (mule-shoe) drain for chronic glaucoma. New method to avoid usually employed flap.** *Annals of Ophthalmology*, January, 1916.

97. ROY, D. **Some observations on the operation of iridotasis for glaucoma.** *Ophthalmic Record*, March, 1916.

98. WOODRUFF, H. W. **Trephining versus iridectomy in glaucoma.** *Annals of Ophthalmology*, January, 1916.

MORAX (94, **Glaucoma simplex or optic atrophy with excavation**) says that there are cases with atrophic and deeply excavated optic disks and an ocular pressure of 20 to 28*mm* Hg which ought to be sharply differentiated from glaucomatous eyes. The atrophy and excavation are not due to the ocular tension since this always remains within the physiologic limits. According to Morax, the process is due to a special affection localized in the blood-vessels or the optic fibers. The differentiation between the two conditions is of great practical importance since increased intraocular pressure and its sequelæ have to be treated differently than ocular and nerve fiber processes. The author reports one of his own and one of Stock's case histories presenting the following characteristic points: (1) a slowly developing double optic atrophy with excavation; (2) absence of pupillary disturbances; (3) absence of modifications in the diameter of the blood-vessels; (4) the disturbance of the visual field (mostly for colors) is more pronounced than the diminution of the visual acuity; (5) the tension is never high (about 22*mm* Hg). A sclero-iridectomy performed in two cases reduced the tension only by 2*mm* Hg. Pilocarpine has no effect upon the tension. Antisyphilitic treatment does not arrest the progress.

SCHOENBERG.

PRINCE (96, **Gold drain for chronic glaucoma**) has experimented with a ring of fine gold wire to which an extension or toe has been attached at right angles. After the usual trephine opening is made he places the toe in the opening and covers the ring with conjunctiva. He finds no irritation from the presence of the foreign body and thinks that it will maintain permanent drainage. He has done the operation eighteen times.

ALLING.

ROY (97, **Iridotasis for glaucoma**) has performed this operation nine times and thinks it very satisfactory. The procedure

was devised by Bothen and consists in drawing a portion of the iris into a keratome wound and covering it with a conjunctival flap. The benefits may not be so much from filtration as from drawing the iris away from the spaces of Fontana.

ALLING.

WOODRUFF (98, **Trephining versus iridectomy**) sounds a note of warning regarding the too free employment of the trephine. The charges against it are hypotony, late infection, and iritis. He thinks that it will remain a valuable method, but believes that indications should be narrowed to those cases in which iridectomy is unsuccessful, in congenital glaucoma, and perhaps some others. ALLING.

MORAX (95, **Ophthalmic zona complicated by glaucoma**) reports two patients, in both of whom the hypertension was overlooked by other ophthalmologists and the use of atropine made conditions worse. An iridectomy in each patient reduced the ocular tension. Such instances should serve as a warning for those using atropine in similar cases.

SCHOENBERG.

ABADIE (93, **Remarks on secondary glaucoma**) emphasizes again the great importance of differentiating genuine from secondary glaucoma. He thinks that the reason so many iridectomies fail to reduce the ocular tension is to be found in the faulty diagnosis. Peripheric chorioretinitis and mild iritis are apt to set up increase of ocular tension which can be treated successfully with tuberculin and mercury, not with iridectomy. He says that infantile glaucoma is not a true glaucoma; it is due to chorioretinal changes at the periphery, and he has seen all his buphthalmos cases improve or even heal under the influence of a prolonged mercurial treatment.

SCHOENBERG.

XVII.—RETINA.

99. BRADBURNE, A. ALISON. **Retinitis pigmentosa in five sisters with glaucoma in three of them.** *Ophthalmic Review*, April–May, 1916, p. 66.

100. CLAIBORNE, J. H. **Hole in the disk.** *Annals of Ophthalmology*, April, 1916.

101. JACKSON, EDW. **Tuberculosis of the retina, recurring hemorrhages, and retinitis proliferans.** *Ibid.*, January, 1916.

102. MAWAS, J. **Researches concerning the histology and chemistry of the white spots in albuminuric retinitis.** *Annales d'oculistique*, cliii., 2.

103. STEPHENSON, SIDNEY. **A fallacy in the diagnosis of glioma retinæ.** *Ophthalmoscope*, January, 1916, p. 14.

BRADBURNE (99, **Retinitis pigmentosa in five sisters with glaucoma in three of them**) reports a family of which the surviving members are six maiden ladies. Five of these have retinitis pigmentosa and in the three youngest of these there is glaucoma.

The mother suffered, as a girl, with difficulty of seeing in the dark, following a severe attack of scarlet fever. There was no consanguinity in the family. Deafmutism was entirely absent in this family.

He considered that the glaucoma in these cases was attributable to the anatomical smallness of the eyes, but the filtrating angle may have been blocked by agglutination of the pigment shreds of epithelial tissue such as were seen in the vitreous humor, together with the blocking of lymph spaces in the choroid and optic nerve with tissue proliferation and sclerosis which occurs in retinitis pigmentosa.

CURRAN.

On the temporal side of one optic nerve CLAIBORNE (100, **Hole in the disk**) found a hole about ¼ of the disk diameter. It was 3 D. in depth. A blood-vessel crossed the bottom and some smaller ones plunged sharply into it from the temporal side. Twenty-five cases have been reported and it is probably a defect allied to coloboma. ALLING.

JACKSON (101, **Tuberculosis of the retina, recurring hemorrhages, and retinitis proliferans**) says that the fact that tuberculous lesions show hemorrhagic tendencies and in healing form connective tissue, adds weight to the present notion that the well-known cases of recurring hemorrhages of the retina in young persons and subsequent connective-tissue formation called retinitis proliferans are tuberculous. He relates two cases of the sort treated with tuberculin—one without recurrence of the hemorrhages. ALLING.

MAWAS (102, **Researches concerning the histology and chemistry of the white spots in albuminuric retinitis**) reaches the following conclusions:

(1) The white spots are due either to exudations in the intergranular layers, to gangliform degeneration in the nerve-

fiber layer, to accumulations of granular cells, or to small detachments of the membrana limitans interna of the retina.

(2) The exudations in the intergranular layers alone are characteristic of albuminuric retinitis. They constitute the stellar arrangement of the placques and most of the other white spots.

(3) There is no cholesterin, fatty, or lipoid substances in the white spots, except in the foci of granular cells.

Five colored plates, drawings after the microscopic specimens, illustrate this interesting paper.

SCHOENBERG.

STEPHENSON (103, **A fallacy in the diagnosis of glioma retinæ**) reports two cases, of retinitis hemorrhagica externa, one of his own and the other Zorab's case, which were diagnosed as glioma retinæ and says that this disease should be considered as a possible source of error in the diagnosis of glioma retinæ.

CURRAN.

XVIII.—OPTIC NERVE.

104. ALT, A. **Bone tissue in the optic nerve, pia mater, and dura matter sheaths.** *American Journal of Ophthalmology*, March, 1916.

105. JESSOP, WALTER H. **Papilloedema in gunshot injuries.** *Ophthalmoscope*, December, 1915, p. 592.

106. KRAUSS, F. **A case of unilateral optic atrophy the sole symptom of pituitary growth.** *Ophthalmic Record*, February, 1916.

ALT (104, **Bone tissue in the optic nerve, pia mater, and dura mater sheaths**) examined the eye of a patient who died of septicæmia, endocarditis, and pneumonia. The optic nerve and retina showed œdema with spaces and cavities. There were in the intervaginal space a large number of amyloid bodies. He found also in the nerve a small irregular shaped body composed of bone tissue—probably starting from amyloid degeneration of the blood-vessel walls. There were besides a large bone plate in the dural sheath and a similar one in the pia mater.

ALLING.

JESSOP (105, **Papilloedema in gunshot injuries**) is impressed with the large proportion of wounds in the head showing papilloedema. In most of the cases the swelling was slight, generally 1 D. and seldom more than 2 D. These cases were

rarely associated with any other ocular signs or symptoms. In cases in which there was suppuration there was a distinct narrow yellowish white ring around the disk having a blurred outline and evidently caused by œdematous effusion.

The percentage of papilloedema in cases of fracture of the vault is estimated to be about sixty-five per cent. Jessop has been unable to make out any connection between the side of the injury and the commencement or amount of swelling of papilloedema.

On the relief of the intracranial pressure the optic disk usually showed no swelling, and although in some cases the disks were afterwards distinctly pale no sign of optic atrophy could be made out by field of vision, acuity of vision, or by the condition of the vessels.

CURRAN.

KRAUSS'S (106, **Unilateral optic atrophy the sole symptom of pituitary growth**) patient was a man of twenty-four, whose left eye showed slight œdema at the macula and a gray nerve. The right eye was normal. The left nerve gradually became atrophic, while the field, which at first was hemianopic (partial scotoma on the temporal side), gradually narrowed on all sides. The right field also, after nine months, showed beginning temporal scotoma. There was loss of hearing in the left ear. The X-ray disclosed an enlarged sella turcica. There were no other symptoms of hypo- or hyper-pituitarism. The operation for sella decompression by the submucous route was performed under local anæsthesia and a portion of the gland was removed for examination. The tissue appeared to be from the anterior lobe and contained particles resembling psammoma bodies. There seems to have been a decided improvement in the right field following the operation but unfortunately the patient died within two weeks from purulent meningitis.

ALLING.

XIX.—INJURIES OF THE EYE.

107. CASSIMATIS. **War injuries of the eyes.** *Clinique ophtalmologique*, vii., 1.

108. HUGUENIN, M. **Traumatic rupture of the ciliary arteries.** *Clinique ophtalmologique*, vii., 2.

109. JOCQS and DUCLOS. **Ocular tuberculosis following an injury of the eye. A clinical and anatomical study.** *Ibid.*, vii., 3.

110. ROLLET, E., and MANGINI, L. **War injuries of the deeper tissues of the eyes with integrity of their outer coatings.** *Ibid.*, vii., 2.

111. VREELAND, F. D. **Injuries to the eye by broken spectacle and eyeglass lenses.** *Ophthalmic Record*, June, 1916.

112. ZORAB, ARTHUR. **Concussion rupture in warfare.** *Ophthalmoscope*, December, 1915, p. 597.

ROLLET and MANGINI (110, **War injuries of the deeper tissues of the eyeball with integrity of its outer coatings**) find that thirteen per cent. (13%) of the wounded soldiers fighting in the trenches and only five per cent. (5%) of the wounded soldiers who have fought in the open, exhibit more or less serious injuries of the eyes. Of all the eye wounds, six per cent. (6%) exhibit serious injuries of the retina and choroid without any apparent damage to the sclera, cornea, or conjunctiva. The authors have seen 96 such cases and the lesions consisted of detachments of the retina (34), rupture of the choroid (22), and retinal and choroidal hemorrhages (33). The paper contains twenty-four pictures illustrating the various types of retinal detachments, and choroidal ruptures they met with.

SCHOENBERG.

ZORAB (112, **Concussion rupture in warfare**) considers that the diagnosis of concussion rupture should only be tentative. He reports two cases, which might be diagnosed as concussion rupture, one of which was followed by sympathetic ophthalmitis without any preliminary signs of inflammation or irritation in the exciting eye which was absolutely quiet to all outward appearance. After enucleation of this eye a small healed puncture was found close to the optic nerve with a tiny bead of pus adherent to the internal aspect of the puncture. No foreign body was found in the vitreous. The entrance wound of which could be found only by ophthalmoscopic examination.

CURRAN.

Out of his experience with ophthalmologic cases of the 1913 Balkan War and of the Gallipoli expedition, CASSIMATIS (107, **War injuries of the eyes**) reports the history of a soldier, shot in the upper lip; the bullet came out through the mastoid region. He remained with a paralysis of the ocular sympathetic fibers on that side (ptosis, myosis, redness of cheek,

and conjunctiva) and complained of complete blindness of the same eye. Since the fundus was normal, the pupil reacted, and there were marked stigmata of hysteria, the author made a diagnosis of hysterical amaurosis. The vision returned in part later on.

SCHOENBERG.

In 1895, Siegrist described a case of traumatic rupture of the ciliary arteries with peculiar ophthalmoscopic changes in the fundus due to trauma, and ascribed these changes to a rupture of the ciliary artery. Nine similar cases have been reported since, by Siegrist, Birkhauser, and Hirsch.

HUGUENIN (108, **Traumatic rupture of the ciliary arteries**) reports in this paper two such cases. One of the patients gave a history of having been struck with a stone in the left eye. V. fingers at 30*cm*. The ophthalmoscope revealed at the first examination, six days after the accident, a red patch in the macular region. After three weeks there was a hole instead of the patch and a yellowish irregularly shaped area surrounding this hole, sparsely pigmented and having a general appearance very similar to the picture described by Siegrist. The second case presented a like ophthalmoscopic picture following a slight injury to the right eye. The chorioretinal changes were situated at the temporal side of the papilla and extended outwards over an area of two disk diameters. There was no hole in the macula. Both these had an absolute central scotoma. The author bases her diagnosis on the history of trauma, location of the ophthalmoscopic lesions, and on the findings of Wagemann's experiments. This author sectioned one of the posterior ciliary arteries in rabbits and found, with the ophthalmoscope, after a certain time, chorioretinal changes very similar in appearance to those described by Siegrist and others in human beings.

SCHOENBERG.

As the result of inquiry among ophthalmologists VREELAND (111, **Injuries to the eye by broken spectacle and eyeglass lenses**) concludes that injuries from broken eyeglasses are very rare. Rimless spectacles are the most dangerous and minus lenses seem to be most likely to cause injury probably because the centers are thin.

ALLING.

JOCQS and DUCLOS (109, **Ocular tuberculosis following an injury of the eye**) had under observation a boy of fifteen years, who had been hit in the eye with a small piece of iron, developing a tuberculosis of the iris, cornea, and ciliary body. The microscopic examination of the enucleated eye confirmed the diagnosis. The authors believe that the infection was inoculated in the cornea at the time of the accident and thence it spread to the iris and the ciliary body. The choroid, retina, and optic nerve remained free from infection.

SCHOENBERG.